MINING WORLD

METAL MINING IN 1951

MINE DEVELOPMENT AND DIRECTORY NUMBER

DIRECTORY OF ACTIVE MINES

★

APRIL 15, 1952

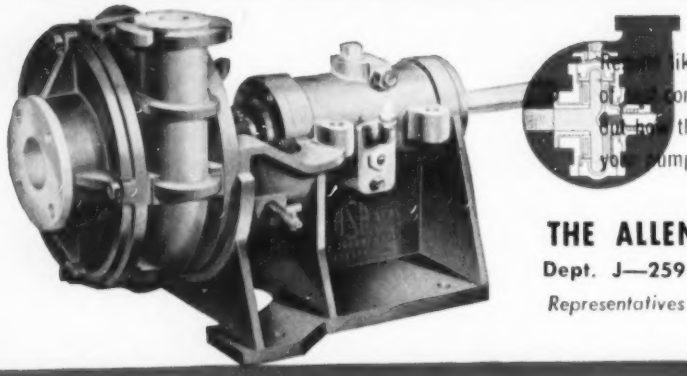
VOL. 14 No. 5

$2.00 a copy

Let's look at the record

This unretouched photograph shows the Maximix Rubber Shell Liner from a Hydroseal Sand Pump after it was taken from service. Here's how it compared with a metal pump casing of conventional design previously used in the same service

	Metal Pump Casing Conventional Sand Pump		Maximix Rubber Liner HYDROSEAL Sand Pump	
WEIGHT OF PART	1,050	POUNDS	105	90% LESS
PUMPED PER DAY	4,000	TONS	11,000	175% MORE
SERVICE LIFE	100	DAYS	340	240% LONGER
TOTAL DELIVERY	400,000	TONS	3,740,000	835% MORE
COST PER TON	0.00284	$	0.000065	98% LESS



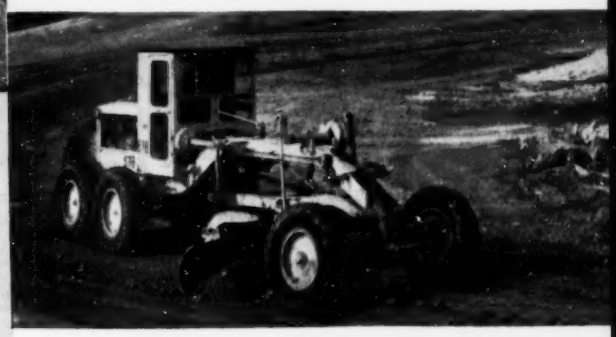
Results like this explain why Hydroseals are the choice of cost-conscious milling engineers the world over. Find out how their economy and efficiency can help you solve your pumping problem. Write for Catalog No. 451 today.

THE ALLEN-SHERMAN-HOFF PUMP CO.
Dept. J—259 E. Lancaster Ave., Wynnewood, Pa.
Representatives in Most Principal Cities

HYDROSEAL SAND, SLURRY & DREDGE PUMPS
MAXIMIX RUBBER PROTECTED

HYDROSEAL, PACKLESS AND MAXIMIX DESIGNS ARE COVERED BY PATENTS AND APPLICATIONS IN THE MAJOR MINING CENTERS OF THE WORLD

Most of the world's molybdenum comes from this Colorado pit. The 12,250-ft. elevation doesn't make the going too tough for this "Cat" Diesel D8 Tractor with No. 8S 'Dozer. Lee Ryan, owner of C. Ryan & Son, says, "We use 'Cat' machines exclusively because they're rugged and economical."



For the Isbell Construction Co., this "Cat" Diesel No. 12 Motor Grader builds and maintains roads for trucks hauling copper ore and approximately 25,000 tons of waste per day from a pit in Nevada's Ingersoll Canyon.

Big yellow machines...

tapping the veins of the earth

A "Caterpillar" Diesel D13000 Engine powers this 1½-yd. Marion Shovel, repiling bauxite and loading trucks for Reynolds Mining Corporation, near Hurricane Creek, Arkansas.

To men who will dig for it, the earth offers a rich harvest of ore and metal. But the men must turn to machines . . . tough, quick, adaptable machines like the "Caterpillar" Diesel products which work at mining throughout the world. "Caterpillar" Diesel Tractors, Bulldozers, Motor Graders and Engines form a fleet of dependable performers, economical to operate, easy to maintain. And the reliable service these big yellow machines give is backed by the experience of "Caterpillar" Dealers everywhere.

CATERPILLAR, SAN LEANDRO, CALIF.; PEORIA, ILL.

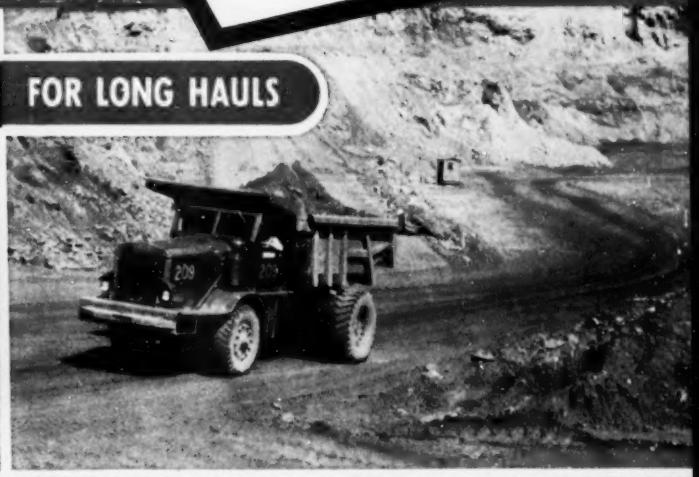
CATERPILLAR

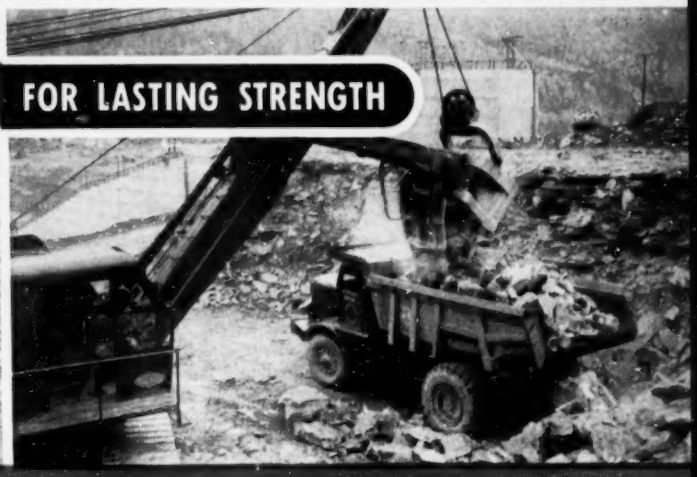
REG. U. S. PAT. OFF.

DIESEL ENGINES
TRACTORS • MOTOR GRADERS
EARTHMOVING EQUIPMENT

MINING WORLD, April 15, Volume 14 No. 5, Published monthly, except April when publication is semi-monthly, at Emmett St., Bristol, Conn. Executive, advertising and editorial offices, 121 Second St., San Francisco 5, California. Subscription in United States, North Central and South America, $3.00 per year; other countries, $4.00 per year. Entered as second class matter Oct. 10, 1951 at the Post Office at Bristol, Conn., under the act of March 3, 1879. Postmaster: please send notice 3579 to MINING WORLD, 71 Columbia St., Seattle 4, Washington.

"EUCS" Are Your Best Bet!





Because of their rugged construction and dependable performance, Rear-Dump Euclids are standard equipment on hundreds of mine, quarry, and construction jobs. For moving rock, ore, overburden and other heavy excavation, "Eucs" have the capacity and speed to haul bigger loads faster and at lower cost per ton or yard moved.

Look at the record! Of the thousands built, nine out of eleven Euclids are still in use today! They're job proved... have earned their reputation for staying power, low-cost production and efficient operation on a wide range of work.

Owners know from experience that they can depend on prompt, efficient service from Euclid's world-wide distributor organization.

Euclids are your best bet for more loads per hour and more profit per load. Write for information on the complete line of Euclid equipment, or call your Euclid Distributor today.

The EUCLID ROAD MACHINERY Co., CLEVELAND 17, OHIO

EUCLIDS *Move the Earth*

Increase your production

BIG

Check this 50-ton rear-dump

50-ton, 41-yd. capacity...
Custom-built for your needs... capacity from 35 to 50 tons ... bodies to fit your job.

Power to fit your job ...
Engines from 275 h.p. Diesel to 450 h.p. Butane... will fit your grade haul conditions.

Choice of transmissions ...
Conventional sliding-gear type... or constant-mesh type for instant speed changes.

***Torque converter available ...**
Automatically selects proper gear ratio, maximum power at all times, removes shock loads in power train.

17'x13' top on 50-ton body
Speeds up shovel or dragline loading, cuts spill at loader, reduces delays for spotting.

30.00x33 low-pressure tires ...
Give extra traction and flotation, longer tire life... absorb shock, help compact fills.

Power-proportioning differential ...
Delivers 4 times more power to drive wheel on firmest footing, pulls through mud, snow.

Fast, over-the-bank dump
Far more brake per ton than any other hauler. Drive wheels stay on solid ground for safe, fast pull-out.

Positive power steer ...
Push-button control of electric motor geared to king-pin gives safe control in any footing.

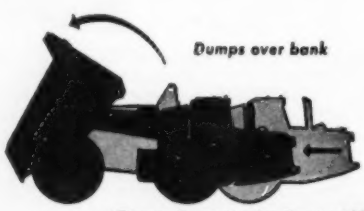
90° turns in 15' radius ...
Big 36' rig turns in less than its own length ... saves time spotting... saves time dumping.

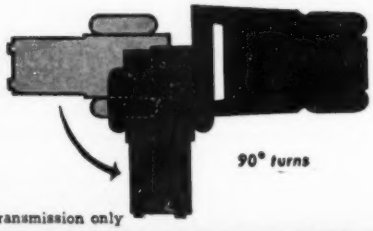
Reinforced steel grid bowl
Floored with ¾" tool steel over grid of 3" steel billets on 8" centers over ½" high carbon steel plate.

Complete self-cleaning ...
Body dumps with floor at 58° angle... induction heating available for winter work.

Simplified, rugged construction ...
No frames, sub-frames, springs, drive shafts, or hydraulic systems to maintain, repair, delay.

4-wheel air brakes ...
Multiple-disc ... 4792 sq. in. total braking surface, far more than other heavy haulers.



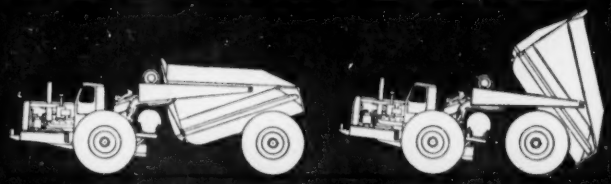


*Torque Converter for Constant-Mesh Transmission only

LETOURNEAU LET EQUIPMENT

Your LeTourneau Distributor will be glad to give you application facts and figures on this big "A" Tournarocker.

with model A Tournarocker



Here are a few of the leading concerns now using high-speed, rear-dump TOURNAROCKERS

Babler & Rogers.....*Oregon*
Bagdad Copper Corporation. *Ariz.*
Roy L. Bair Co.....*Washington*
Barrage de l'Iril Emda....*Algeria*
Bates & Rogers.....*Illinois*
J. Robert Bazley, Inc.....*Penn.*
Billiton Mines.....*Surinam*
Adolph Bockus.....*Ohio*
Borderland Colleries.....*W. Va.*
Constructores Nacionales...*Mex.*
Dunn Limestone Co.....*Indiana*
Ft. Hartford Stone Quarry....*Ky.*
General Construction Co...*Wash.*
Grand Rapids Gravel Co....*Mich.*
Carl M. Halvorson.....*Oregon*
Horner & Switzer.....*Colorado*
Vernie Jarl.....*Oregon*
Leonard & Slate Ltd.
and E. C. Hall.....*Oregon*
Marsh Construction Co....*Illinois*
McGraw Construction Co....*Ohio*

Monolith Portland Cement Co....
.....*California*
Morrison-Knudsen Co., Inc.....
.....*British Columbia*
Muskoka Construction Co., Ltd...
.....*Ontario*
Nya Asfalt Aktiebolaget and
Svenska Vag Aktiebolaget.....
.....*Sweden*
Fred Onuparik Construction Co...
.....*Connecticut*
Orange Construction Co...*W. Va.*

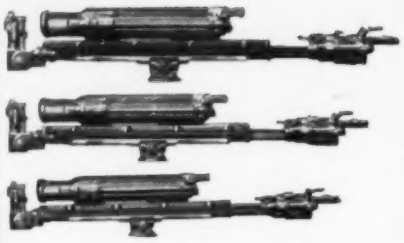
Republic Steel Co.....*Alabama*
Skousen-Hise Contracting Co....
.....*New Mexico*
John Stark.....*Kansas*
Sydvaranger, A/S.....*Norway*
United Province Government.....
.....*India*
T. W. Ward Co., Ltd.....*England*
Frank W. Whitcomb Construction Corp.....*New Hampshire*
B. G. Young & Sons....*Tennessee*

Tournarocker—Trademark Reg. U. S. Pat. Off. C155

R. G. Le Tourneau, Inc.

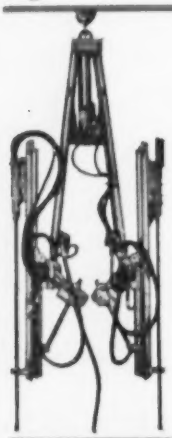
PEORIA, ILLINOIS

★ Air-feed sinkers — 2-way feed, 2 sizes. They take the back-breaking work out of drilling horizontal holes, lighten the load on your miners, and increase tonnages.

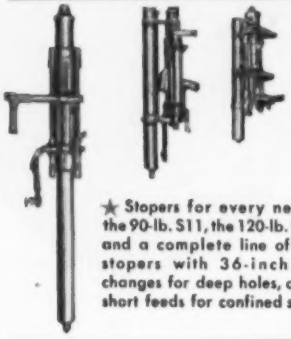


★ Power-feed and hand-cranked drifters. Dependable, powerful, and fast. Ideal for columns and jumbos alike.

★ A complete line of sinkers from 18 to 80 lbs. including the popular 45-lb. H10, and 55-lb. H111.



★ The SDR 34 shaft sinker for faster shaft sinking. Fully closed it's 5'6" between drill centers; open 19'3". All adjustments quickly made with air motor.



★ Stopers for every need — the 90-lb. S11, the 120-lb. SS-22, and a complete line of offset stopers with 36-inch steel changes for deep holes, or with short feeds for confined spaces.

It's Le Roi-CLEVELAND

for

Rock Drills You Can Count On

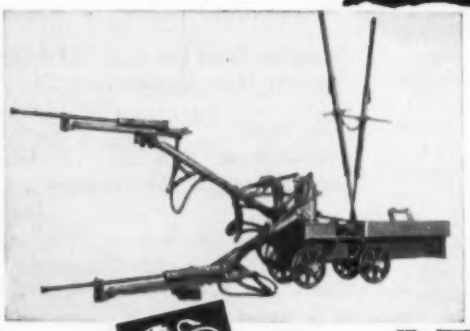
. . . . . fast-drilling, dependable favorites of mining men since 1906

Of course, you know that Le Roi-CLEVELAND builds the popular, easy-holding H10 and H111 sinkers... the fast-drilling PD24, 25, and 14 power feed drifters . . . the S11 and SS22 stopers with trip rotation for easier handling . . . and a mine jumbo that lets you drill out your rounds faster, with greater safety.

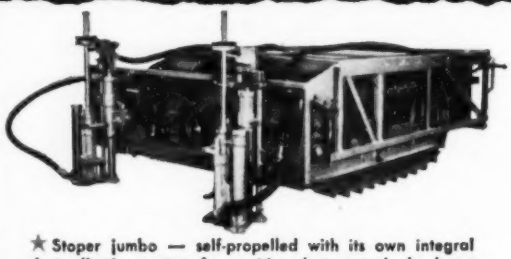
But did you know that Le Roi-CLEVELAND was responsible for some famous "firsts"? Here are a few of them—work-savers that help your miners increase their man-shift production: the air-feed sinker, the offset stoper, the shaft sinker, the stoper jumbo.

So if you have a job of drilling to do—do it with Le Roi-CLEVELAND machines. You can count on them. They're built for speed. And they're built to stay underground, too — where you can use this speed to do more work and cut your costs.

Detailed information about the complete Le Roi-CLEVELAND rock drill line is yours for the asking. Just write us.



★ The famous MDR Jumbo with air-motor poweredbooms for quicker setups, greater safety, faster rounds.



★ Stoper jumbo — self-propelled with its own integral dust-collection system for positive dust control, the latest thing for roof bolting.

LE ROI

LE ROI COMPANY

RD-39

CLEVELAND ROCK DRILL DIVISION
12500 Berea Road, Cleveland 11, Ohio
Plants: Milwaukee, Cleveland and Greenwich, Ohio

"This is where we came in . . ."

The picture that's coming up on the "news reels" now is one that we all remember. Once again Uncle Sam is a big machinery customer with first call on output.

This doesn't mean that we can't take care of our old customers . . . but it may mean that we can't do it as promptly as you've learned to expect. You may have to wait a bit longer for that new shovel, dragline or crane. But it's in a worthy cause . . . and to compensate, may we suggest that you take a little extra care to make your present equipment last?

We're not suggesting that you *pamper* the machines. Lima equipment is designed and built to take a terrific beating, and you can keep right on demanding a full day's work from every unit. But almost every piece in service gets some *unnecessary* punishment, because proper maintenance is neglected. If you focus on proper care—which every good piece of machinery deserves—you'll keep the Lima's at their working peak considerably longer.

For further information
write to
BALDWIN-LIMA-HAMILTON CORPORATION
Lima-Hamilton Division
Lima, Ohio, U. S. A.

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SHOVELS • CRANES • DRAGLINES • PULLSHOVELS • TRUCK CRANES

DINGS

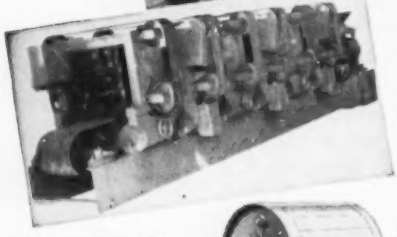
magnetic equipment for every mining requirement!

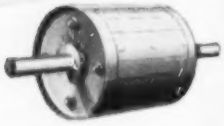
Dings Rectangular Electromagnet provides maximum iron removal above belts or chutes. Triple pole design for great magnetic strength and depth of penetration. Maximum magnetic strength across entire magnet face. Easily installed in any position. Low operating cost . . . trouble free . . . complete range of sizes.

(Right) Induced Roll Separator purifying sand.

Battery of Crockett Separators concentrating magnetite. (Left)

Magnetic Detector signals presence of tramp iron. (Right)





NEW, powerful Cross Belt Separator — with higher selectivity—for concentration and purification (Above)

NEW, powerful, non-electric Alnico Perma-Pulley for purifying, cobbing, protecting crushers, pulverizers, etc. Magnetic permanence guaranteed for life of installation. (Above)

Wherever crushers must be protected against tramp iron, wherever magnetic separation can contribute to the beneficiation of ores, you will find Dings magnetic separators specially designed to meet the requirements of the job. Dings magnetic separators have played an important role in making the extraction of many minerals possible and economically feasible. Shown here are a few of the machines which Dings has pioneered exclusively for the mining industry for the following purposes:

CONCENTRATION—everything from specially designed pulleys for cobbing nickel ores to powerful induced roll and cross belt separators for concentrating manganese, tungsten, chrome, titanium and many other minerals.

PURIFICATION—removing small amounts of feebly magnetic impurities with super high intensity separators. Minerals treated include feldspar, silica sand, salt, bauxite, barytes, nepheline-synenite, gypsum.

CRUSHER PROTECTION—magnetic pulleys, pulley type separators, drums, suspension magnets, spout magnets and magnetic detectors are all widely applied for arresting tramp iron ahead of crushing equipment.

WET TYPE SEPARATORS—Dings has pioneered in the development of wet type separators for concentrating magnetite and for use in new processes for concentrating low grade ores. *Ask for complete details of Dings Separators for Heavy Media Process Plants.*

Take advantage of Dings equipment and experience. For practical recommendations, submit your requirements with 25 lb. samples of material to the Dings Laboratory for testing and analysis. Literature on request.

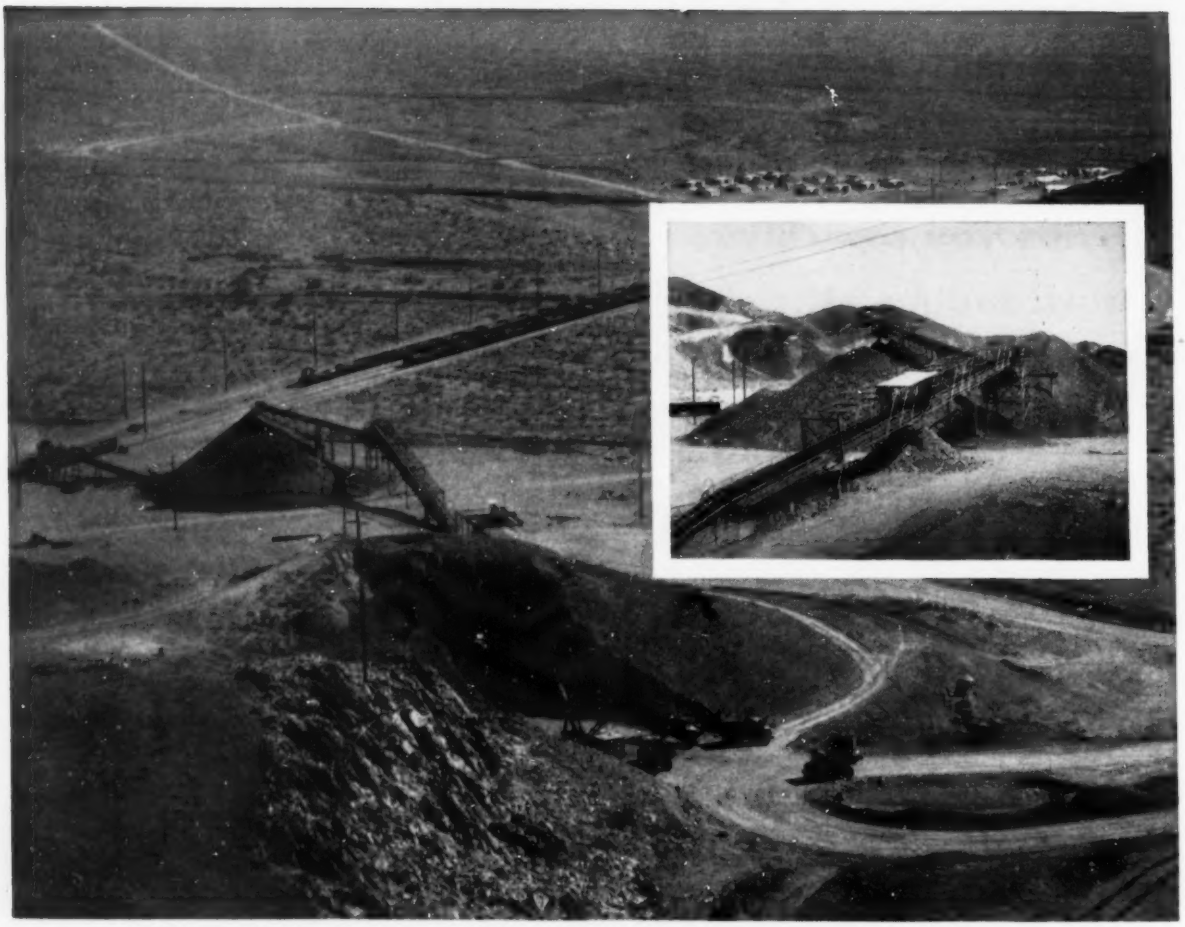
DINGS MAGNETIC SEPARATOR CO.

4719 W. ELECTRIC AVENUE, MILWAUKEE 14, WISCONSIN

"Magnetic Separation Headquarters Since 1899"

Dings

"HIGH INTENSITY"



VITAL LINK in Modern "Truck Pit" Mining— *at 3500 Tons a Day*

Ore from an open cut is trucked to a crusher at the mine, then stock-piled in uniform reduced sizes—available for shipment by rail as needed to furnaces 166 miles away. Use of S-A heavy-duty conveyors, boom stacker and pan feeders in the operation is typical of "truck pit" mining. This fast, convenient high capacity installation for handling primary crushed ore was designed by S-A in co-operation with Kaiser Company engineers.

Installations like this are typical of the versatility of the S-A staff. In answering diversified conveying and bulk materials problems these men draw on 50 years of accumulated experience. Because Stephens-Adamson makes *all types* of bulk materials handling equipment, our engineers are free to recommend the best unit or combination of units for any specific need.

There's no obligation on your part in talking over your needs with S-A engineers. Write today!

KAISER COMPANY
Eagle Mountain Mine, Calif.

Primary crushed ore is fed to a belt conveyor by an S-A Amsco Manganese Steel Pan Feeder which carries it up to a pivoted stacking belt conveyor distributing over storage area. Ore is reclaimed through a tunnel under the storage pile. In turn, it is fed out over another pan feeder to a belt conveyor which moves it to a bin located over waiting gondolas.

50 years experience 1901-1951 *with bulk handling*

STEPHENS-ADAMSON MFG. CO.

13 Ridgeway Avenue, Aurora, Illinois · Los Angeles, Calif. · Belleville, Ontario

DESIGNERS AND MANUFACTURERS OF ALL TYPES OF BULK MATERIALS HANDLING EQUIPMENT

NOW... SCREEN FINE, MOIST MATERIALS

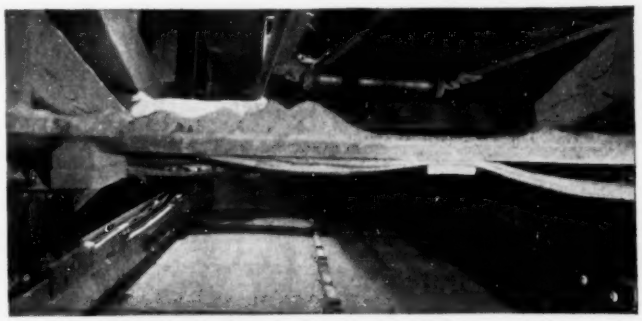
ALLIS-CHALMERS THERMO-DECK Heating Unit

Without Blinding!

NO "TIME OUT" to clear fine or medium mesh screen cloth! You can screen fine, moist non-combustible materials *continuously* with new *Thermo-Deck* heating unit.

INCREASED CAPACITY! Heated screen cloth *remains* open, permitting more tonnage through the screen and better separation.

LOWER COSTS! Operating records show that heated screen cloth lasts up to three times as long when cloth does not have to be pounded free of blinding material. The *Thermo-Deck* heating unit can be easily applied in the field. Your nearby A-C representative can give you more details. Allis-Chalmers, Milwaukee 1, Wisconsin. A-3602



POWER ON — *Thermo-Deck* heating unit keeps screen cloth clear on screen handling pulverized limestone.

POWER OFF — Troublesome blinding results on same screen when *Thermo-Deck* heating unit is turned off.

Send for...

New 8-page bulletin containing complete facts on operation and application of the *Thermo-Deck* heating unit.

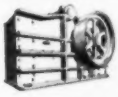
Bulletin 07B7812

Thermo-Deck is an Allis-Chalmers trademark.

ALLIS-CHALMERS

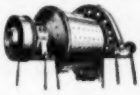
Sales Offices in Principal Cities in the U. S. A. Distributors Throughout the World.

Pulverator



Jaw Crushers

Gyratory Crushers



Grinding Mills

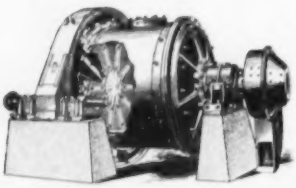
Vibrating Screens

Kilns, Coolers, Dryers

EQUIPMENT TO LOWER YOUR PRODUCTION COSTS

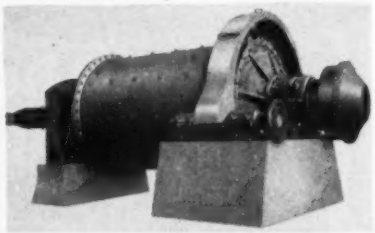
MARCY OPEN-END MILLS

Marcy ball, rod and tube mills have greater grinding capacity than conventional mills, with a lower per-ton cost, because of the Marcy Low Pulp Line. The open-end discharge removes finished sands without wasteful overgrinding, increasing useful grinding capacity with better product uniformity.

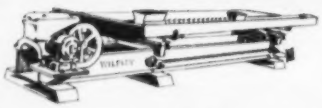


Marcy ball mills, in closed circuit grinding, will deliver a product of 200 mesh and finer, or coarser if desired. Available in a variety of drives with capacities ranging from 5 to 2500 tons per day. Laboratory sizes available.

Marcy rod mills will produce a 20-mesh product (or coarser, as desired) in one pass from a 1-inch feed, or finer products when working in closed circuit. Can be furnished in capacities up to 6000 tons of 1-inch feed of average ore reduced to 20-mesh.

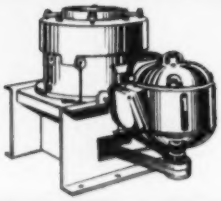


Genuine Wilfley Concentrating Tables



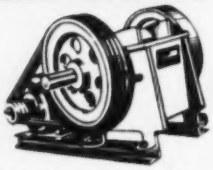
The Wilfley Table will give more exact separation of products, increased recovery, and a greater capacity at a lower cost of operation and upkeep than comparable equipment. It is mechanically operated and consists of a self-oiling, enclosed head motion operating an endwise reciprocating table with a rubber or linoleum covered deck surface properly riffled. The Wilfley Table is capable of dressing any ore or material subject to gravity concentration. Available in a complete range of sizes up to 180 tons capacity per 24 hours. Laboratory sizes also available.

Massco Gy-Roll Reduction Laboratory Crushers



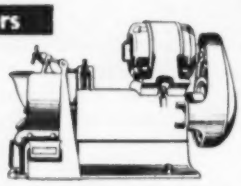
Reduces ½" feed to as fine as 10 mesh in a single pass. Very high capacity and low power consumption; replaces bulky, unhandy equipment such as rolls and coffee mill. Two sizes available, 6" and 10"

Improved Massco Laboratory Crushers



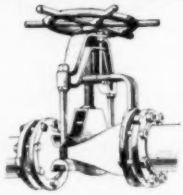
Most crushers crush faster than they can discharge. This one gets rid of the rock in a hurry. Two blows every revolution mean minimum oversize. Plate wear taken up by front adjustment through convenient hand wheel. Smooth jaws insure better product and easier cleaning. No shims, set-screws or toggles. Welded plate frame; manganese steel jaw and cheek plates; bronze bushed bearings; Lincoln grease fittings. Strong and compact but relatively light.

Massco-McCool Pulverizers



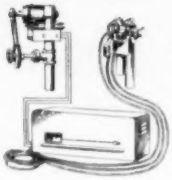
The Massco-McCool Pulverizer is a disc-type grinder designed for pulverizing to any mesh, in one operation, virtually any material. Ideal for the assay, metallurgical, chemical and industrial laboratory. The planetary movement of the rotating disc assures long life to the grinding surfaces. This machine will grind to 150 mesh at one pass—and more samples per hour at lower cost. No gears; oil lubricated; 100% anti-friction bearings.

Massco-Grigsby Rubber Pinch Valves



Wherever abrasive or corrosive pulps or liquids must be moved, these valves are finding wide use. Useful in ore milling, cement plants, dredging, and many industrial operations where severe wear makes frequent replacement of metal type valves necessary and costly. With certain modifications, these valves are adaptable in chemical plants for handling highly corrosive solutions, solutions which crystallize at normal temperatures, oily liquids, and fine dry materials. Shuts tight, through patented sleeve design, even on solid particles. No packing glands. Freezing does not deteriorate sleeve. Easy to operate. Sizes—1" and 2" for continuous pressure to 100 lbs., 3", 4", 6", 8", 10" and 12", to 150 lbs. State your application.

Massco-Adams Density Controllers



This pulp density control eliminates both the frequent checking of classifier density and manual regulation of water by the attendant. Water dilution is regulated to maintain percentage of solids within close limits of any predetermined point. Thus, size of finished product is controlled. Results in maximum efficiency in classification and grinding at optimum capacity. In any closed circuit grinding, results depend upon pulp density in the classifier. The Massco-Adams Density Controller regulates density automatically and continuously.

Massco-Adams Reagent Feeders

A portable independent unit for permanent or temporary service, quickly placed in operation at any work height. Economical; requires no electrical connections, has no moving parts, only one micrometer screw adjustment. Adaptable to most types of wet reagents and liquids, easily cleaned, trouble-free. Accurate within one percent, with adjustable feed rate. Operates on siphon principle, avoids oxidation or reprecipitation of reagent due to agitation.

Representatives: Canadian Vickers, Ltd., Montreal;
W. R. Judson, Santiago and Lima;
The Edward J. Nell Co., Manila, P.I.;
The Ore & Chemical Corp., 80 Broad St., New York 4, N.Y., Representatives for Continental Europe.

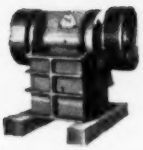
BRANCH OFFICES
El Paso **Salt Lake City**
1775 Broadway, New York, N. Y.

THE MINE AND SMELTER SUPPLY COMPANY

DENVER, COLORADO

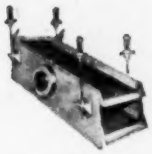
Denver "Sub-A" Flotation

Denver Disc Filters

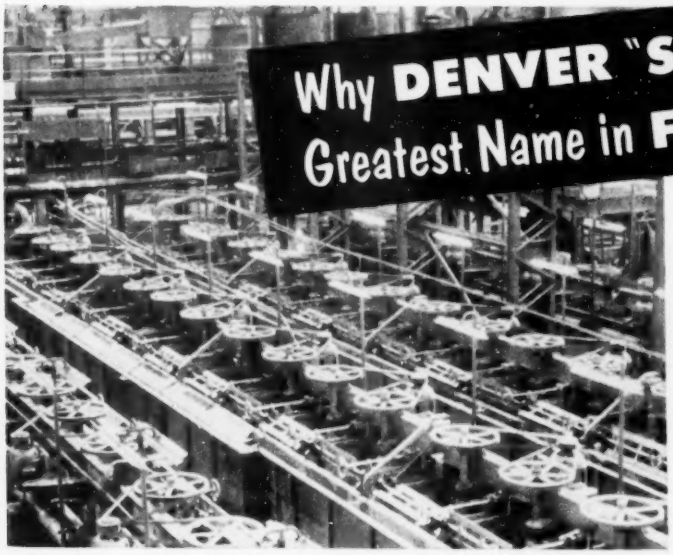


Denver Jaw Crushers

Denver Steel-Head Ball Mills



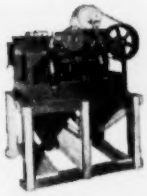
Denver-Dillon Vibrating Screens



Why DENVER "SUB-A" is the Greatest Name in FLOTATION

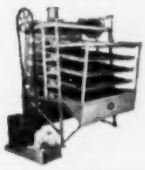
Denver Super Agitator and Conditioners

This copper concentrator made exhaustive tests—erected a 500 ton per day pilot plant; compared flotation machines. These tests proved Denver "Sub-A" greatness. They now have 32 No. 24 and 120 No. 30 Denver "Sub-A" Flotation Cells treating 5000 tons of copper ore per 24 hrs.



Denver Selective Mineral Jigs

DENVER "Sub-A's" are standard flotation machines, flexible to meet changing conditions of your ore. They are built to give mill operators those tools needed to get results that pay greatest profits.



Denver-Buckman Concentrators

Proof of Denver "Sub-A" greatness is the fact that over 33,000 Denver "Sub-A" Flotation Cells are serving around the world!

Moreover, there are more Denver "Sub-A's"—*probably more than all other Flotation Machines combined*—because Denver "Sub-A's" are the very best! This is an important fact. It has been proved many times by competitive tests.

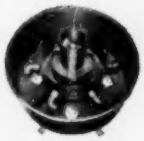
Tests, like those conducted by the large copper concentrator pictured above prove that comparing capacity for capacity, horsepower for horsepower, cost per ton of ore processed and smelter receipts for concentrates produced, DENVER "SUB-A's" *are best by a very substantial margin.*

This copper concentrator tested many different flotation machines. The net result—*and it is the NET RESULT that means profits*—was definitely in favor of Denver "Sub-A" Flotation.

FACTS about the Leader

Denver Thickeners

In 25 years DECO has pioneered practically every major improvement in Flotation. Denver "Sub-A" was first with low-head design, steel tanks, molded rubber wearing parts, supercharged aeration and many more features of flexibility that improve metallurgy and simplify mill operation.



Denver Pulp Distributor

Our 25th Year of Flotation Engineering

Write FIRST to DECO for complete mill equipment from testing to feeder to dryer.

DENVER EQUIPMENT COMPANY 24 HOUR SERVICE

FLOTATION ENGINEER

DENVER • NEW YORK • CHICAGO • EL PASO

TORONTO • VANCOUVER • MEXICO, D. F.

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"The firm that makes its friends happier, healthier, and wealthier"

DENVER EQUIPMENT COMPANY

1400 SEVENTEENTH STREET • DENVER 17, COLORADO

F-5202

8 Years Work in 3

LOADS OVER 1,600,000 TONS . . .

From August 1948 to June 1951, this ¾-yard Lorain TL25 shovel has worked *continuously* for 16,000 grueling hours loading lead mill tailings . . . 24-hours-per-day . . . 7 days per-week. That's equal to almost 8 years of ordinary 40-hour-per-week service. Average output was 2400 to 3000 tons of material every 24-hours . . . somewhere between 1,600,000 and 2,000,000 total tons. This performance record explains why 2 more Lorain TL-25's have joined this "young veteran" which is still in service! With a Lorain "TL" on the job, you, too, can get record-breaking performance!

REASONS FOR RECORD-BREAKING "TL-25" PERFORMANCE

Check amazing Lorain "TL-25" performance with your Thew-Lorain Distributor . . . ask about these exclusive design advantages . . . √ "Packaged" Components — engine, clutch shaft, etc. — may be removed and replaced as complete units √ 5 identical, interchangeable clutches √ One-piece, all-welded turntable bed √ Anti-friction bearings √ Complete package design — no extras to buy √ 3 sizes of 2 speed crawlers √ 4 rubber-tire mountings √ 5 interchangeable front ends √ Get *all* the facts on the Lorain-TL-25 from your nearby Thew-Lorain Distributor.

THE THEW SHOVEL CO., LORAIN, OHIO

LORAINS NO. 2 & 3 were purchased by this owner based on the steady 24-hour performance record of their first Lorain TL 25.

SEE YOUR THEW LORAIN DISTRIBUTOR FOR FACTS ON THE TL 25

THEW LORAIN®

THEW-LORAIN®

TRUCO DIAMOND BITS

Custom Built
to Your Job in any size
to give you Faster
Penetration at
lower footage cost

Truco bits are used throughout the world *because*

- ★ they hold gauge longer
- ★ they cut faster
- ★ they are exceptionally tough and absorb punishment
- ★ they give greater salvage
- ★ they are available in SOFT, MEDIUM or HARD matrix to provide highest efficiency in any formation
- ★ they are backed by a speedy resetting service.

Write for information and prices.

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3200 W. Davison Avenue
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WHEEL TRUEING TOOL CO. of CANADA, LTD.
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Windsor, Ont. • Canada


Wherever ores are processed . . .
"SYMONS"
GYRATORY AND CONE CRUSHERS FOR PRIMARY, SECONDARY AND FINE REDUCTION CRUSHING
BALL, TUBE, AND ROD MILLS FOR WET AND DRY GRINDING
"SYMONS"
VIBRATING GRIZZLIES AND VIBRATING SCREENS FOR SCALPING and SIZING
Gulf of Mexico
WEST INDIES
Caribbean Sea
VENEZUELA
M152

What's ahead for you?

Increased demands for ore production from your mine?

A stepped-up development program to reach your ore reserves?

Hard rock you've got to "hole through" in a hurry?

A program to hold down production costs?

Gardner-Denver CF89H Automatic Feed Drifters.

Gardner-Denver Model CF Automatic Feed Drifter with feed motor on drill backhead. The extruded aluminum guide shell, with movable cone, provides long steel changes—accommodates changes of irregular length.

Gardner-Denver Model SF Automatic Feed Drifter, with feed motor mounted on five-foot change aluminum alloy guide shell.

For complete information on Gardner-Denver Drifters, send today for Bulletin DD2.

For help in solving mining problems such as these, choose famous Gardner-Denver Automatic Feed Drifters. They're designed by men who know what it takes to do a fast, low-cost drilling job underground.

The Gardner-Denver self-adjusting feed, for example, responds automatically to bit penetration — is automatically regulated by the type of ground being drilled. Maximum drilling speed is easily maintained—"green" miners drill almost as fast as "old-timers." The long-wearing, "slow-motion" piston feed motor is economical to operate, too—uses only 3% to 5% of the total air consumption of the drill.

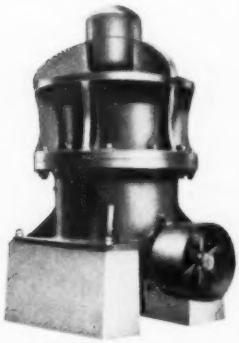
SINCE 1859

GARDNER-DENVER

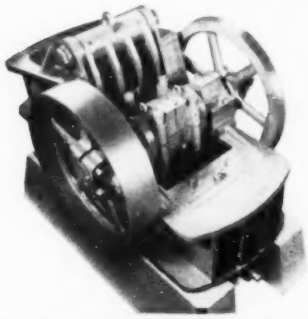
Export Division: 233 Broadway, New York 7, N. Y., U.S.A.
Gardner-Denver Company, Quincy, Illinois, U.S.A.

THE QUALITY LEADER IN COMPRESSORS, PUMPS AND ROCK DRILLS

50 years



The Traylor TY Reduction Crusher is a perfect example of compact, simple design for efficient operation. Ask for Bulletin 6112.



The Traylor Type H Jaw Crusher is just one of 33 sizes available to meet your needs. For specifications and descriptions, ask for Bulletin 4105.

The Traylor TC Gyratory, with its curved concaves and bell head, incorporates proven principles of efficient crusher design. Ask for Bulletin 126.

...makes a

BIG DIFFERENCE

A comparison of ancient and modern methods of ore reduction is truly amazing . . . especially when we realize how great have been the advances during the past 50 years alone. In that time, Traylor has spearheaded the development of machinery for the mining industry by introducing a wide range of more efficient equipment for crushing ore. As mining methods changed, Traylor took the lead in supplying new and improved equipment to fit each specialized job. When you need crushing equipment, buy the make with a world-wide reputation for efficiency and economy of operation . . . buy Traylor. 50 years experience makes a big difference.

TRAYLOR ENGINEERING & MANUFACTURING CO.
400 MILL ST., ALLENTOWN, PA.

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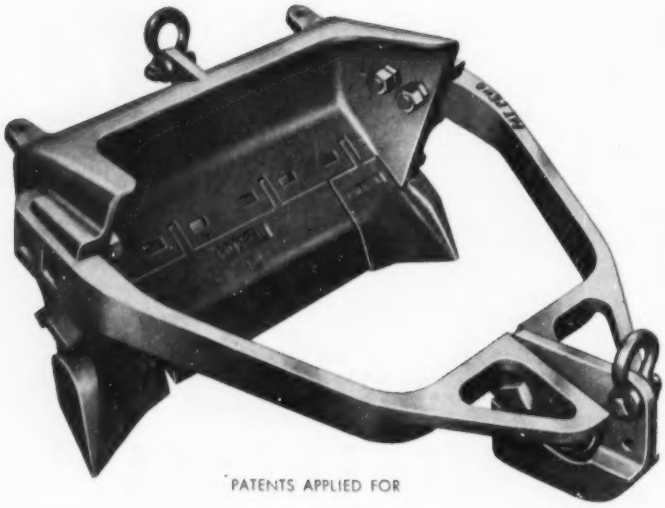
Canadian Vickers, Ltd.
Montreal, P.Q.

OUR GOLDEN ANNIVERSARY YEAR
1902 1952

Traylor

PACIFIC...world's fine



PATENTS APPLIED FOR

PACIFIC "SLUSHMASTER"

World's best scraper! Designed by mining men for mining efficiency. Digs in, gets a *full* load *in a single pass,* regardless of type or size of material or slope of muck pile. Weight distribution assures maximum digging ability. Balanced design—tilts and rides on runners on back haul. Easily replaceable, reinforced digging corners. For the complete story, send for bulletin.

The Pacific "Slushmaster" scraper is available in the following models and sizes:

MODEL	SIZE	WEIGHT
2A	26"	398 lbs.
2A	30"	424 lbs.
2A	34"	452 lbs.
AB	36"	622 lbs.
AB	42"	664 lbs.
2B	36"	1176 lbs.
2B	42"	1314 lbs.
2B	48"	1400 lbs.
2C	60"	2191 lbs.

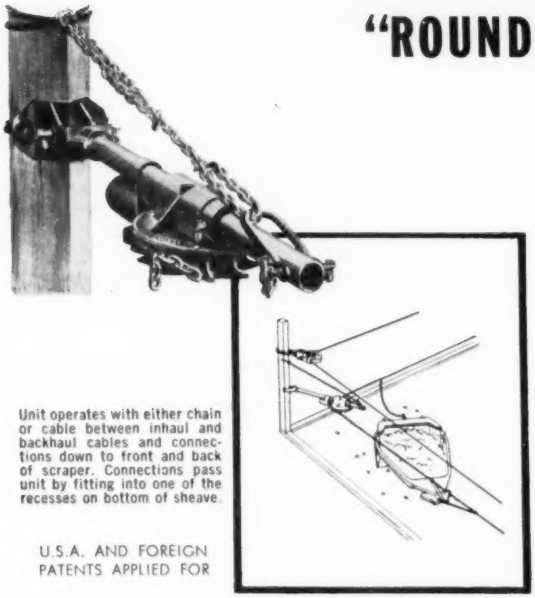
Other Pacific Mining Products:

PACIFIC JAW CRUSHERS, Sizes: (6" x 12" to 15" x 38")
MANGANESE STEEL CRUSHER JAWS
MANGANESE STEEL TRACTOR SPROCKETS
MANGANESE STEEL TRACTOR IDLER RIMS
PACIFIC ROCK BIT GRINDERS
CRAWLER SHOES FOR POWER SHOVELS

PACIFIC BIT KNOCKER... A new, low-cost tool especially designed for quicker, easier rock bit changing. Two models handle any section of drill steel from 7/8" hexagon through 1¼" round. Fits any of the single-pass bits now on the market.

est mining equipment!

"ROUND THE CORNER" SHEAVE BLOCK



Unit operates with either chain or cable between inhaul and backhaul cables and connections down to front and back of scraper. Connections pass unit by fitting into one of the recesses on bottom of sheave.

U.S.A. AND FOREIGN PATENTS APPLIED FOR

NEWEST THING IN MINING — Now you can slush around corners *in one setup!* Pays for itself in a short time. With this amazing new Pacific "Round the Corner" Sheave Block, you can go around one, two or more corners with a single scraper. Thoroughly field tested. Light — Portable — Easily installed in timbered or hard rock mining operations.

Unit illustrated is made for operating with scraper hoists up to and including 20 H.P. For satisfactory operation it is necessary to use "Slushmaster" or Pacific Drag Scraper.

PACIFIC SHEAVE BLOCKS

Simple—Rugged—Durable. Models C and CF, half shroud and full shroud (illustrated) made in 8", 10" and 12" sizes. Manganese steel wheels and side frames. Roller Bearings. Available with hook, shackle and safety swivel shackle. Pacific manufactures a complete line of Sheave Blocks including 16" tail block assemblies, 8" wide-throat guide sheave blocks and others. Send for bulletin.

Model CF with Hook — Model C with Safety Swivel Shackle — Model CF with Shackle

PACIFIC SHEAVE ANCHORS

Provide a firm, dependable anchor for fastening sheave blocks, vent pipes, etc. in rock walls. Made of tough, alloy steel castings, heat treated to assure maximum strength. Available in four popular sizes. Send for bulletin.

ALLOY STEEL & METALS CO.

1862 EAST 55TH STREET, LOS ANGELES 58, CALIFORNIA

Low Cost Concentration

with the

Humphreys Spiral Concentrator

★ *for* separation of minerals of different specific gravity in ores at sizes generally minus 10 mesh.

★ *for* recovery of liberated values too coarse for flotation.

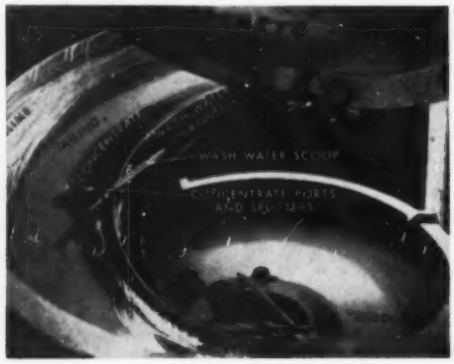
★ *for* recovery of other ore values from flotation tailing.

★ *for* recovery of values too fine to be economically treated by heavy-media separation.

★ *for* cleaning minus ¼ inch bituminous or anthracite coal.

Low cost of installation
Low operating costs
No moving parts

Concentrating action of Humphreys Spiral—Note wide black band of concentrate entering upper outlet, which is set for a wide cut, also narrow black band of middling entering lower outlet set for thin cut. In cleaning fine coal, phosphate rock and mica, refuse and middling are discharged from the concentrate ports and cleaned product follows the path shown as tailing.



The installation, operation and maintenance costs of Humphreys Spirals are so low that economical concentration of materials, which could not heretofore be worked at a profit, is now possible. There are no moving parts, no vibration, weight per unit of capacity is low and requires only a light foundation. Floor space per ton treated is very small.

HUMPHREYS SPIRALS are widely used in plant operations in the United States and abroad, ranging from 30 tons to 20,000 tons daily capacity, for concentration of fine iron ore; for concentration of chromite, ilmenite, rutile, and zircon from sands; for concentration of ground ores for recovery of lead, zinc, chromite, copper, barite, mica; for concentration of molybdenum flotation mill tailing for recovery of tungsten; for separation of fine phosphate rock from sand; for cleaning minus ¼ inch coal; for concentration of pyrite from flotation mill tailing; for concentration of fine gold and gold bearing minerals.

A testing laboratory is maintained in Denver by the Engineering Division of The Humphreys Investment Company. Results obtainable in a full size plant may be determined by tests of a representative sample of minerals or coal weighing 300-500 pounds.

THE HUMPHREYS INVESTMENT COMPANY
ENGINEERING DIVISION
913 First National Bank Building • Denver 2, Colorado

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and the export edition

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A Miller Freeman Publication

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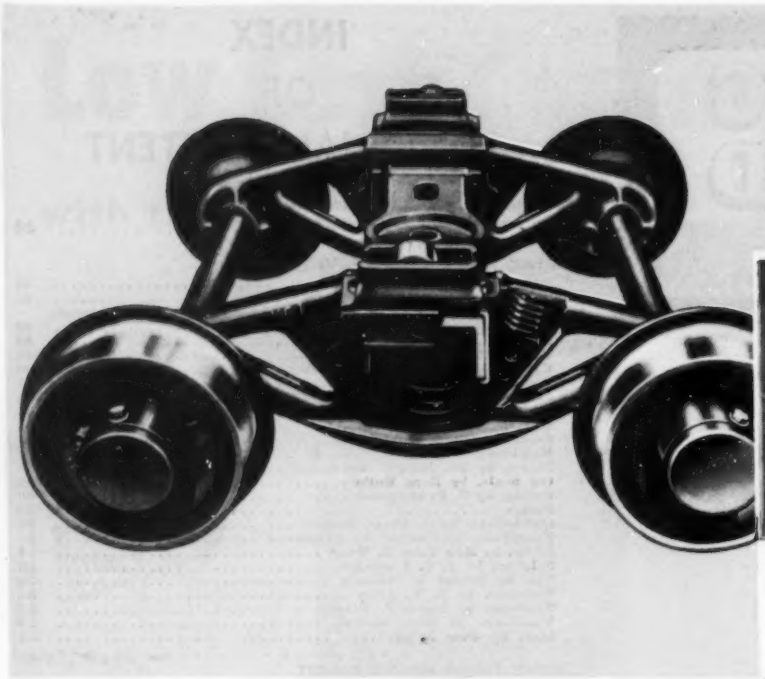
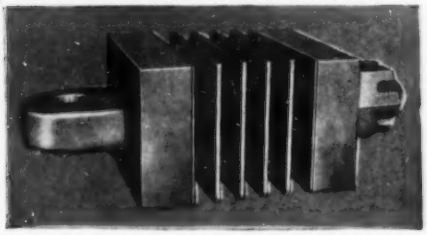


The NC-1 Truck climaxes 20 years of intensive research, providing (through the friction control mechanism shown in cutaway) protection to equipment, roadbed and lading with maximum wear life.

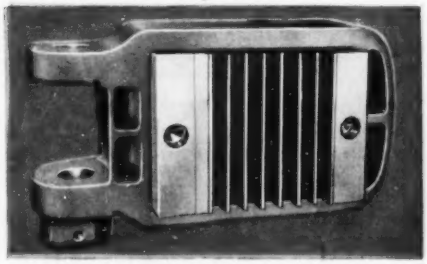
Willison Automatic Couplers save time with maximum safety . . . can be coupled at either end of car or locomotive . . . require no manual assistance. Close coupling eliminates damaging slack, permits high speeds with maximum stability.

NATIONAL *products cut per ton costs!*



National M-230 Rubber-Cushioned Draft Gear for cars operating through rotary dump. Soft initial-action, high-capacity rubber pads provide maximum impact protection, lengthen equipment life. Available in a range of capacities and design variations to fit individual requirements.

Latest example of National's pioneering in better equipment is the NC-1 Truck. Its sweeping advancements over conventional trucks include long soft springs, a friction mechanism—controlling vertical and transverse oscillations, a cast one-piece bolster with large lubricated center connection, and automatic frame alignment. The NC-1 has been designed with the same factor of safety that is required by the Association of American Railroads for full size railroad trucks, and embodies the same features which A.A.R. tests have shown to be essential to produce good riding qualities. For the best in profitable equipment, *always specify National products.*



M-225 Rubber-Cushioned Draft Gear for locomotives and large capacity cars not required to operate through rotary dump. Maximum protection in minimum space.

A-3863

NATIONAL *Products* FOR TRANSPORTATION AND INDUSTRY

NATIONAL MALLEABLE and STEEL CASTINGS COMPANY

WILLISON AUTOMATIC COUPLERS • NC-1 TRUCKS • DRAFT GEARS • NACO STEEL WHEELS

For Modern MINES

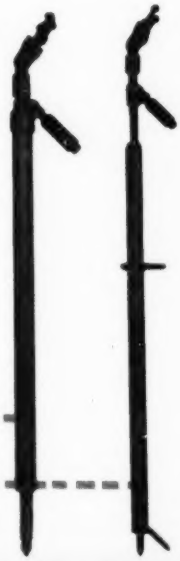
Thor SINKER LEGS

SENSATION OF THE MINING INDUSTRY

Compact air feed leg clamps to standard Sinker Rock Drill, converts upward lifting action to positive forward feeding pressure. Drills holes at any angle!

Thor PORTABLE POWER TOOLS

and Mining Applications



FOOL-PROOF CONTROLS—Roll-type feed throttle and air bleeder valve button, located side by side, give drill runner complete control of operation at all times.

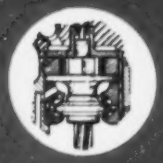
EXCLUSIVE "AROUND THE CYLINDER" CLAMPING. Bayonet connection permits drill and cradle to be removed as unit for use as Sinker or for instantaneous replacement by larger or smaller drills.

PISTON ROD STATIONARY. Model 53, 36" nominal feed travel, weight 38 lbs.

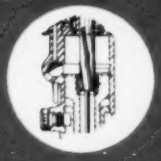
CYLINDER STATIONARY. Model 63, 48" nominal feed travel, weight 50 lbs. Model 64, 38" feed travel, weight 44 lbs.

NDEPENDENT PNEUMATIC TOOL COMPANY • AURORA, ILLINOIS

Printed in U.S.A.



EXCLUSIVE AUTOMATIC VALVE utilizes ALL the air that enters the machine, measures it for most effective use through machined tolerances of .00025 of an inch. No separate valve parts to lose or wear!



"STRAIGHT LINE" BLOWING — Blower Valve puts compressed air at full line pressure directly through the tool to the drilling face. Heavy blast blows the hole clean, prevents "stuck steels."

Thor SINKER ROCK DRILLS

30 lb.
No. 28

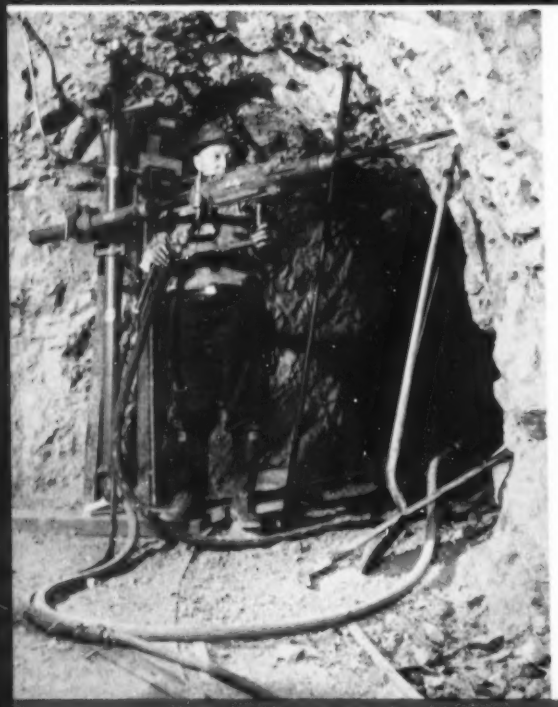
Ideal for light to medium drilling and block holing up to 6 feet deep. For coal mining, can be equipped with side exhaust and rotation on the power stroke for augering. Spring wire retainer optional.

35 lb.
Nos. 33 and 35

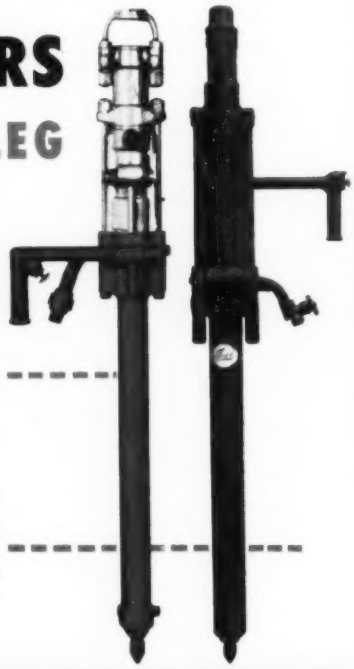
These drills are designed for secondary drilling up to 8 feet deep; light weight for drilling horizontal and upward holes. No. 35 is equipped for full line pressure blowing.

45 lb.
No. 38

An all-purpose medium weight Sinker for holes up to 12 feet deep. Mounted on Sinker Leg can be used for Drifting, especially with carbide bits. With Thor Stoper Leg, the No. 38 can be adapted to stoping.



Thor STOPERS and STOPER LEG

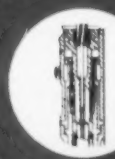


STOPER LEG

Supports and feeds Sinker Rock Drills for overhead drilling. Can be used with Thor No. 38 or 48 Rock Drills, simply by removing two bolts and backhead. Order No. 51 Stoper Leg. Weight 46 lbs. 18" steel change.

STANDARD AND REVERSE FEED STOPERS

Three sizes, six models with standard or reverse feed to handle all stoping and other overhead drilling operations. Reverse feed permits machines to be used in horizontal positions on pneumatic columns. (See photo, left).



ENDLESS PISTON LIFE — Years of practical field experience show piston breakage practically eliminated in Thor Rock Drills, amazing life for contacting surfaces.

AUTOMATIC LUBRICATION — Built-in lubricator forces oil under pressure through all moving parts with every reciprocation of the piston hammer.

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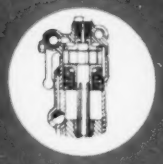

RIFLE BAR ASSEMBLIES available in standard, slow, fast and special rotation speeds to provide for efficient drilling in various types of rock formation.

AUGER ROCK DRILLS

55 lb.
Nos. 72 and 75

For drilling holes up to 20 feet deep in hardest rock. Recommended for shaft sinking. Can be used with Thor Sinker Leg or Air Bar Feed for economical carbide bit drifting. No. 75 uses collared steel, No. 72 for steels with round lugged shank or tappet construction for plain shank hexagon steels.

80 lb.
No. 85B

A husky, powerful Sinker for heaviest duty service in hardest rock, where conditions calls for a hand held drill to sink holes up to 25 feet deep. Recommended for heavy duty shaft sinking.

35 lb.
No. 139

45 lb.
No. 48

Equipped with augering rotation on the power stroke. Recommended for all iron, bauxite and anthracite mines, and for tunneling through shale and slate, cemented gravel, talc, clay and other loose or broken formations. (See also 30 lb. No. 28 Drill).

Thor POWER-FEED DRIFTERS

POWER UNIT operates drill on shell independently of Drifter—no vibration during rapid advance or return . . . no recoil, positive spring cushion stop, better balance — for LONGER TOOL LIFE.

- Perfect power for carbide bit drilling.
- Perfect control at ALL drilling speeds.
- 25% more efficient by actual mine tests!

New development provides full power at slowest speeds: drill starts moving immediately upon opening of motor throttle . . . from fast drilling down to a 2-inch per minute crawl. Ideal for carbide bit drilling . . . and for jumbo mounting.

THREE SIZES: RF-48, 24" + 24" feed; RF-60, 30" + 30" feed; RF-96 (aluminum), 48" + 48" feed.

REPLACEABLE CHUCK — Quick, easy, economical chuck replacement protects against excessive steel breakage or damage to the piston hammers.

RUBBER CUSHIONED RETAINER absorbs shock while drill steel is being removed from hole. Fully enclosed, dirt proof operating parts assure low maintenance.

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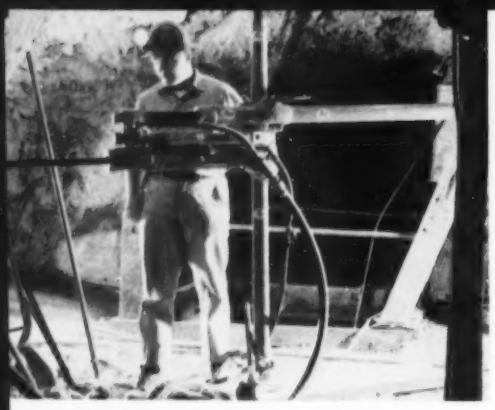

PNEUMATIC COLUMNS. Exclusive four-foot travel eliminates timbering. Safety throttle and spring-actuated check-valve prevent accidental collapse of column. Two-prong foot standard; four-prong foot available for extra stability when using arms. Accommodate air bar feeds, reverse feed stopers, hand or power feed drifters. Three sizes: TC-6 (6 to 10 ft.); TC-8 (8 to 12 ft.); TC-10 (10 to 14 ft.)

Thor AIR BAR FEEDS

For mounting on Thor Pneumatic Columns (see photo, left), or on 3" or 3½" screw jack column and arm, cross bar or jumbo set up.

Converts hand-crank Drifters — and Sinkers — to power feed, forward and reverse. Feeds from any position, in any direction. Four models available for drifting, stoping and sinking with Thor Nos. 82 and 92 Drifters, No. 75 Sinker. 32" nominal feed.

CLAMPS. Complete line, for pneumatic or screw-jack columns.

AIR BAR FEED supports and feeds Drifters and Sinkers.

Thor SUMP PUMPS

Self-priming . . . operate efficiently in dirty water, oil . . . partially or fully submerged. Exclusive large capacity lubricating system lubricates all moving parts up to a full shift. Two sizes.

361T. A medium size pump most effective up to a 60 foot head (114 gal. per min. at 60 ft. head, 90 lbs. pressure). Can be furnished to operate in tandem, pumping up to a total head of 160 feet at 90 lbs. pressure.

381T. For continuous heavy duty pumping to high levels (50 gals per min. at 160 ft. head, 90 lbs. pressure).

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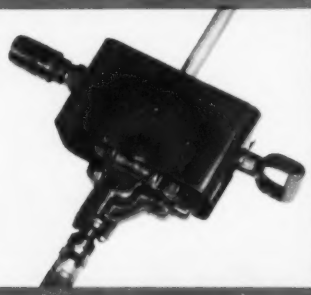

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AN ACCOUNTING OF WORLD MINING FOR 1951

By

CHARLES WILL WRIGHT, consultant on foreign mines. Member AIME.

and

JOHN BEAUPRE DORSH, engineer of Mines. Member AIME.

FOREWORD

The speeding up of mineral production to meet increasing demands for the defense program continued throughout 1951. Mineral output in countries around the world, with few exceptions, continued at or above 1950 levels. Under the Controlled Materials Plan, which allocates materials for warplanes instead of pleasure cars, civilian and non-essential use of metals was curtailed in the U. S.

Political influences rather than economic, however, highlighted the minerals industry during 1951. Huge sums of government money budgeted for armaments, directly reflected the international political situation. In the United States, the defense account at the close of the year showed:

Reserve for armaments, voted July 1, 1951	$130,000,000,000
Expenditures to December 31, 1951	35,200,000,000
Balance	94,800,000,000

As this is written, most of the armament spending is for defense-supporting activities, such as the building of alumina and aluminum plants, steel mills, power installations, transmission lines, and factories for the manufacture of machine tools.

The schedule of defense production is expected to reach peak rates in 1953. During 1951, the procurement facilities of governments and private enterprise have concentrated their efforts on the development of sources of supply for the raw materials required to attain production objectives. It is anticipated that until the crisis is passed, there will be no slackening in the demand for critical materials. Furthermore, as defense industry requirements grow, smaller allocations will be made to civilian and non-essential consumers. Metals were the first items restricted by the National Production Authority and it does not appear that relief from this type of control will be forthcoming during the life of the rearmament program. Iron and steel comprise the great bulk of metal tonnage needs. About 60 percent of available supplies of copper and aluminum will go into armaments during the first quarter of 1952, and nickel, zinc, and tin will continue tight.

The U. S. dominates the world in steel production with half the global output, but depends largely on imports for the ferroalloy metals—chromium, cobalt, nickel, manganese and tungsten. For most nonferrous metals, we continue to be increasingly dependent on imports to meet our requirements, and supplies probably will be tight for a longer period than for steel.

The following predictions may be looked upon as indicative of trends with respect to metals during the forthcoming year: Demand will outstrip the supply of copper. United States output of aluminum probably will exceed 2,000,000,000 pounds but no surplus will arise. Supplies of lead and zinc may approach demand in the last half of the year on a world-wide basis. Steel will fall far short of world demand. Among the ferroalloy metals, cobalt will remain in extremely short supply. Tungsten may ease to some extent but there will be no lessening in the demand for nickel.

In the field of nonmetallic minerals, increased consumption of sulphur and fluorspar has changed the U. S. position from that of an exporter to importer. The U. S. still depends upon foreign suppliers for all of its industrial diamonds, quartz crystals and corundum, and nearly all asbestos, sheet mica, and graphite requirements. Outstanding improvements have been made in technical methods of mineral exploration, mining and metallurgy, but only a brief summary of new developments can be mentioned.

THE FERROUS METALS

IRON ORE—In 1951 the estimated iron ore produced in the U. S. showed an all-time record of 116,430,000 gross tons, a 16 percent increase over that of 1950. The Lake Superior district contributed 93,950,000 tons, the Northeastern states 5,070,000 tons, the Southeastern states 8,420,000 tons, and the Western states 8,350,000 tons. The total output of the Free World is estimated at about 200,000,000 tons. Data on the output of the Soviet Union and its satellite countries are not available. It was probably well over 30,000,000 tons. Total imports of iron ore amounted to 10,146,199 gross tons; Chile supplied 27 percent, Sweden 25, Canada 19, Brazil 10, Venezuela 6, and the balance came from British West Africa, Liberia, etc. Canada, on the other hand, received 3,349,602 gross tons from the U. S., while Japan received 954,842 tons from mines near the West Coast.

During 1951, exceptional progress was made in research and development for full-scale production from the taconite ores, and for the beneficiation of low-grade ores, the HMS, flotation, magnetic, and gravity methods have been successfully applied. The largest taconite plant is to be that of the Reserve Mining Company at Beaver Bay, Minnesota, which is to process 7,500,000 tons a year, and to yield 2,500,000 tons of 64 percent iron concentrate. The total planned output from taconite is 10,000,000 tons of this high-grade product.

Outstanding has been the large increase in the number of HMS plants for treatment of large tailing dumps and low-grade ores that were discarded in the past, in the Lake Superior dis-

Free World supplies of zinc will be increased as zinc fuming plants under construction in 1951 are completed. Shown here is one of the most important of these plants under construction. It is the Cia Metalurgica del Norte S. A., ASARCO subsidiary, Avalos plant near Chihuahua City, Chihuahua, Mexico. Leslie E. Harris is supervising engineer for ASARCO, and A. A. Collins is manager, and V. R. MacDonald general superintendent.

trict. These plants are reported to produce concentrates for 40 cents a ton, with the loss of about one pound of ferrosilicon per ton of feed. The first flotation plant for iron ore is being built at the old Humboldt mine near Marquette, Michigan, by the Cleveland-Cliff Iron Company and the Ford Motor Company. Several other iron ore producers are also planning similar plants. Both jigs and the Dutch State Mines cyclones are also proving successful in the treatment of fine ores under 4 mesh in size which are not adaptable to HMS.

To meet future iron ore needs estimated at 144,000,000 tons in 1953, the steel companies are also developing extensive foreign iron ore deposits. The largest of these is Cerro Bolivar in Venezuela, operated by the Orinoco Mining Company, a subsidiary of the U. S. Steel Corporation. Contracts have been let which include a 90-mile railroad and highway from the mine to Puerto Ordaz, the construction of the port with loading facilities, and the dredging of the Orinoco River for ocean-going ships to Serpents Mouth, a distance of 170 miles. This is expected to be finished in October 1953, and annual shipments of high-grade ore from Venezuela are expected to total 16,000,000 tons. The most important, because of their more favorable location, are probably the Quebec-Labrador deposits, which, when in full production, are expected to yield 20,000,000 tons a year.

Among the recent discoveries is the iron-ore range in Mauretania, West Africa, where a number of high-grade ore deposits have been prospected over a length of 20 miles, and estimates indicate probable reserves of 200,000,000 tons.

FERROALLOYS

All of the ferroalloying minerals—chromite, manganese, tungsten, nickel, cobalt and molybdenum—are now being stockpiled as rapidly as possible. The Defense Minerals Procurement Agency is responsible for their procurement. Nickel, tungsten, cobalt, and molybdenum are now on international allocation by the International Materials Conference.

CHROMITE—Starting with chromite, domestic production in 1951 was 6,900 short tons and imports 1,435,000 short tons. South Africa and Turkey supplied 48 percent, the Philippines and Southern Rhodesia 38, and Cuba and New Caledonia 11. Consumption in 1951 will probably reach 1,200,000 tons. Price increases amounted to about 25 percent. The U. S. consumes over half of the world's output and 94 percent of imports are from the Eastern Hemisphere.

MANGANESE—Domestic production of manganese ore containing over 35 percent amounted to about 110,000 short tons, of which Montana produced over 90 percent. Imports of manganese ore in 1951 amounted to about 1,765,000 short tons and that of ferromanganese 120,000 short tons. Of the ore imports, India supplied 32 percent, South Africa and the Gold Coast each about 20, Cuba 8 and Mexico 5. One-third of the world's output is consumed in the U. S. and 80 percent of imports come from the Eastern Hemisphere. The Urucum and Amapa deposits in Brazil now being actively developed by the U. S. Steel Corporation and Bethlehem Steel Company will greatly reduce this percentage from the Eastern Hemisphere in a few years.

TUNGSTEN—Domestic production of tungsten concentrates containing 60 percent WO_3 in 1951 was 6,167 short tons, as compared with 4,244 tons in 1950. Total imports of ore and concentrates were 3,785 short tons of contained tungsten, of which 2,389 short tons were for consumption and the balance entered bonded warehouses. U. S. consumption of tungsten in 1951 was 6,542 tons.

Of the 1951 imports, Portugal supplied 17 percent, Brazil 14.5, Bolivia 14.5, Australia 11, Siam 11.5 and Korea 7.5. Because of the large price increase, the U. S. House of Representatives voted to suspend the import duty for two years, unless the price drops to below $63.00 per short ton unit.

New mine developments in the United States, Mexico, Canada, and Brazil will, within a few years, make the Western Hemisphere less dependent upon imports from the East.

NICKEL—With growing emphasis on specialty steels, plus new markets in jet engines and electronics, nickel's long-term growth trend should continue upwards.

Because of the increased demand for nickel, not only in the U. S. but in other Free-World countries, this metal is now under complete allocation by the IMC. U. S. government restrictions leave only 20 percent of supply to nonessential users. New U. S. supply in 1951 was slightly more than in 1950, and, due to increased operating costs, the price was advanced to 56½ cents a pound on June 1, 1951. International Nickel Company of Canada, Ltd., achieved its objective of increasing production of refined nickel by 1,000,000 pounds a month in 1951—five months ahead of target date. New developments are being extended to increase the output of its Sudbury mines. Falconbridge Nickel Mines, Ltd., is sinking three new shafts and development at the Lynn Lake mine of the Sheritt Gordon Company continued. These projected developments should be in production by 1953. Rehabilitation of the Nicaro plant in Cuba is underway. Production began early in 1952 under the management of the Nickel Processing Corporation. The planned capacity is 15,000 tons of nickel oxide annually.

The output of nickel in Canada during 1951 was about 138,000 short tons, as compared with 122,000 tons in 1950. Nickel consumption in the United States in 1951 was about 85,000 tons, or 14 percent less than in 1950. Renewed interest is being taken in the nickel silicate deposits in Oregon; also in the extensive deposits of nickel silicate in the State of Goias in Brazil.

COBALT—Because of the increasing use of cobalt in high-temperature alloys for jet engines and other military machines, and because of inadequate supplies, a search for new sources of supply the world over is underway. Attempts to revive activity in the Cobalt-Gowganda silver and cobalt area in Canada have resulted in an output of 30,000 pounds of cobalt a month. The Falconbridge Nickel Company is also establishing a new plant at Kristiansand in Norway for the recovery of cobalt from its nickel ores. In the United States, the Bethlehem Steel Company has been the principal producer of commercial cobalt. In 1951 the Calera Mining Company began production of cobalt concentrate in Idaho and is now building a refinery near Salt Lake City, Utah, scheduled to produce the metal at a rate of 3,300,000 pounds a year. Also, the National Lead Company is to build a plant to produce cobalt, nickel, and copper at Frederickstown, Missouri, and is expected to add 1,380,000 pounds of cobalt to the annual output.

The Belgian Congo continues to be the world's largest cobalt-producing country and output was at a record rate in 1951.

Domestic production of cobalt metal in 1951 was 1,955,145 pounds and that of cobalt oxide and salts of cobalt was 1,358,794 of contained cobalt. Imports were about 10,100,000 pounds, of which Belgian Congo supplied 6,833,330 pounds, Belgium 3,000,500 pounds of the metal and 431,000 pounds of oxide, and Canada 230,000 pounds of the metal and 4,900 pounds in oxide and salt compounds. Cobalt consumption in the U. S. increased from 8,283,408 pounds in 1950 to 9,932,993 pounds in 1951. Metallic industries took 8,555,475 pounds, the nonmetallic industries 559,518 pounds, and chemical and other industries 818,000 pounds.

MOLYBDENUM—Because of the increasing demand for molybdenum, the concentrates have been placed under allocation and orders issued by NPA covering use of the metal and primary products. Shipments of concentrates totaled 37,775,000 pounds (contained molybdenum) of which 3,235,000 pounds were exported. The U. S. production represents about 90 percent of the world output, most of which comes from the Climax Molybdenum Company's mine at Climax, Colorado.

TITANIUM—Interest in titanium metal is not as keen today as it was a year ago because widespread commercial application will necessitate lower prices and titanium has not proved to be a high-temperature metal. In 1951, just over 500 tons were produced by the Kroll process. Research on titanium is now attempting to improve the Kroll process and to find a new method that will reduce present production costs Na-

tional Lead Company's Titanium Metals Corporation, which acquired the old Basic Magnesium plant at Henderson, Nevada, is preparing to produce titanium by the end of 1952 at the rate of 10 tons a day. The Quebec Iron and Titanium Company's smelter at Sorel, Quebec, has had one furnace in operation during 1951. Also, Kennecott Copper Corporation is reportedly building a pilot plant with the help of Battelle Memorial Institute to process titanium metal, and the DuPont subsidiary, Rem-Cru, is involved in research studies on lower-cost production for this light metal.

THE BASE METALS

Next in importance to steel is an adequate supply of base metals which is vital for national defense. The Americas are particularly fortunate in possessing the major sources of copper, lead, and zinc. However, it is also important to prevent the export of these vital commodities to countries that are building armament industries for world conquest. The Americas must not weaken their present favorable position by permitting the sale and export of these metals to "behind the curtain" countries, either through government agreements or private trade. There are foreign ore buyers throughout the Americas, including the U. S., offering to purchase these metals or their concentrates at well above the present controlled prices. Such sales are depriving the Western Hemisphere nations of substantial tonnages of metals now needed for the defense industries.

The Americas are not so badly off as many of the countries in the Eastern Hemisphere, but the U. S., the main consumer of the base metals, is none the less vulnerable for the sea lanes from Chile, Peru, and Argentina would be open to enemy submarines in case of war.

COPPER—World smelter production of copper dropped from a maximum of 3,076,000 short tons in 1942 to 2,962,000 short tons in 1950, and of this tonnage the U. S. consumed about one-half. Domestic mine production of copper was 929,000 tons in 1951. U. S. consumption of new copper rose to 1,309,000 short tons in 1951. The estimated U. S. production for 1954 is just over a 1,000,000 short tons while consumption may reach 1,500,000. The U. S. will thus still be dependent upon foreign supply sources for about one-third of its requirements. In the meantime, 1951 copper imports were 41,000 tons per month, 29 percent below the 1950 monthly average. Fabricators have exhausted their surplus stocks and are working on a hand-to-machine basis; some have gone on a four-day week, despite huge piles of orders. This critical shortage was recognized when copper was included with steel and aluminum under the CMP. The outlook is for a copper shortage until 1954 when several important development projects in Chile and Peru will be in production, as well as several in the U. S., among which are White Pine in Michigan; San Manuel, Bisbee East, Silverbell, and Copper Cities in Arizona; Yerrington and Deep Ruth in Nevada; and the Greater Butte project in Montana. In Canada, the Sheritt-Gordon, East Sullivan, Gaspe and Falconbridge mines will also add about 20,000 tons to the copper output in a few years. The new domestic projects, exclusive of San Manuel, will produce an estimated 140,000 tons of copper by 1954.

LEAD—Although the demand for lead exceeded supplies in the U. S., the world situation is less serious. The 1951 world smelter production is estimated to be 1,790,000 short tons and U. S. consumption 1,182,000 short tons, of which 499,000 were secondary lead. U. S. mine production of lead dropped from 430,837 short tons in 1950 to 390,428 short tons in 1951.

Lead has lost much of its white-lead pigment market to titanium oxide and the foil market to aluminum. An offset, however, has been the use of lead in tetraethyl gasoline, a rapidly expanding field. A small but swiftly growing user of lead is the atomic industry as atomic piles require thick lead walls.

The outstanding development of lead ore abroad has been in Morocco at the Zellidja mine and adjoining properties of the Societi Africaine du Plomb, and a new mill of 4,000 tons daily capacity has recently been completed. Canadian mines are expected to increase their lead production from 188,000 tons in 1951 to 200,000 tons in 1954. Also, in Southern Africa several new lead-zinc-copper deposits are being developed. In the U. S., no large, new, lead mining districts have been found, but there have been worthwhile discoveries extending the boundaries of existing districts.

ZINC—Demands for zinc have grown sharply and at the end of 1951 inventories of consumers were greatly reduced. United States' mine production rose from 623,375 tons in 1950 to about 679,000 tons in 1951.

The outlook for zinc, however, is more favorable than that of copper and the several new deposits under development should relieve the present shortage within a few years. Developments include the recent discoveries of the American Zinc Company in the Jefferson City district in Tennessee, and several projects in Idaho and the State of Washington adjoining British Columbia. Also under investigation or development in Quebec are the important Barvue and Pershcourt orebodies with millions of tons of zinc ore. New developments in Canada should increase zinc production from 342,000 tons in 1951 to an estimated 430,000 tons in 1954. New developments in Peru will also add important tonnages of zinc to the world output.

If concentrates are available, the 1952 production of the U. S. smelters should exceed 1,000,000 tons of slab zinc.

MERCURY—Domestic mercury production in 1951 rose to about 6,500 flasks or 30 percent above that of 1950. This was due to the higher price which during 1951 averaged about $212.00 a flask. Domestic consumption also rose from about 46,000 flasks in 1950 to nearly 52,000 in 1951. Both Spain and Italy each produced at least 50,000 flasks in 1951, about one-half of which was exported to the U. S. World mercury production capacity is adequate for known world needs, and our stockpile is well-supplied with this metal for the immediate future. Nevertheless, exploration loans are being granted on a matching-funds basis. There is no evidence that the former Spanish-Italian mercury cartel will be revived.

THE LIGHT METALS

BAUXITE—Bauxite mining again showed a general worldwide upswing, activity in this mineral being especially noteworthy in Jamaica where both the Kaiser Aluminum and Chemical Corporation and the Reynolds Metals Company are preparing to mine what is purportedly the world's largest deposit. Other activity includes expanding mining plants in Arkansas and Surinam.

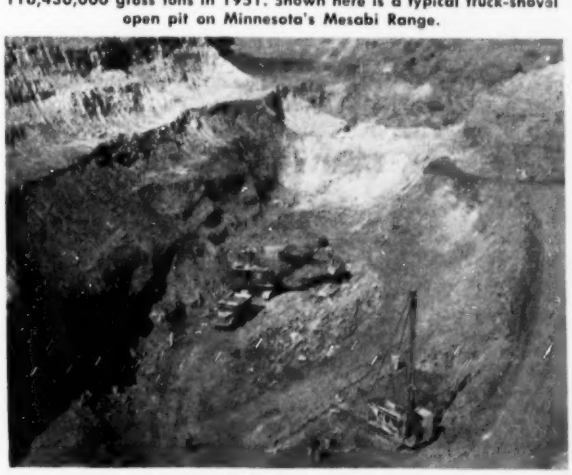
During 1951, the bauxite industry was undergoing a major expansion to meet the increasing requirements of the domestic aluminum industry. As calculated from the production of primary aluminum, approximately 3,350,000 tons of ore were consumed in the production of aluminum, which usually accounts for about 85 percent of the total consumption. The consumption of bauxite by the abrasive, chemical, refractory, and other industries also increased over the 1950 total figure of 442,000 tons.

Domestic bauxite production was estimated at 1,800,000 long tons (dry basis) for the year. The average rate of production for 1951 was exceeded only during the critical war years, 1942, to 1944, when imports were partially cut off at a time of great demand. More than 98 percent was mined in Arkansas, and the remainder in Alabama and Georgia. Surinam shipped about 83 percent of the imports, Indonesia 12, and British Guiana 5.

In July, the issuance of an amendment to Mineral Order No. 5 included bauxite among the minerals for which exploration loans might be granted. Metal-grade and refractory-grade bauxite were among the commodities on the purchase list for the National Stockpile at the end of 1951.

Alcoa was expanding its Bayer alumina plants at both Mobile, Alabama, and East St. Louis, Illinois, in 1951. Also, Alcoa initiated construction of a new alumina plant at Bauxite, Arkansas, which is designed to use the combination process in treating high-silica Arkansas ore. Kaiser plans to produce all of its increased alumina requirements by enlarging the facilities at Baton Rouge, Louisiana, to an annual capacity of about 800,000 tons. This plant will be adapted to treat both Jamaican

United States' iron ore miners produced a record high tonnage—116,430,000 gross tons in 1951. Shown here is a typical truck-shovel open pit on Minnesota's Mesabi Range.



and Surinam ore. Reynolds enlarged the Hurricane Creek, Arkansas, plant to include modified Bayer equipment for using Jamaican bauxite. In addition, Reynolds was planning to construct a new modified Bayer alumina plant, which will be adjoining the new Corpus Christi, Texas, reduction plant. The total capacity of all the alumina plants will be about doubled by this expansion program. Some of these facilities were installed during 1951, but most will reach completion in 1952. A total of 5,000,000 tons of bauxite will be required to supply the aluminum for this expansion program.

ALUMINUM—Domestic output of primary aluminum rose to 836,900 short tons or six times that of 1929, three times that of 1940, and 16 percent over that of 1950. To meet the requirements of the military and essential civilian users, aluminum intended for stockpile was diverted to industry and in December this metal was drawn from the stockpile for industry consumption. Imports of pig and ingot were about 123,000 tons, a decrease of 30 percent from 1950. Canada accounted for 86 percent of the imports. Present plans call for domestic capacity of 1,500,000 short tons by 1953. In 1951 approximately 60 percent of the United States' bauxite supply was imported. Most of the increased bauxite requirements for the expansion programs are to be obtained from new mines in Jamaica and by increased domestic production of high-silica bauxites.

The apparent consumption of primary aluminum in 1951 was 962,000 short tons, and in 1952 all of the increased production and available imports will be necessary to meet the demands of industry. The total production of the Free-World countries in 1951 is estimated at 1,740,000 short tons and of this the United States produced 48 percent, Canada 25, France 6, Germany 5, Norway 4, Italy 3 and Japan, Great Britain, Switzerland, and Austria each 2. From available information, the 1951 aluminum production of the Soviet Union is estimated at 220,000 short tons or about 12 percent of the total world production.

MAGNESIUM—Government-subsidized plants which in 1944 produced 157,000 tons of magnesium were shut down after World War II, except those of the Dow Chemical Company at Freeport, Texas, and domestic production dropped to about 5,000 tons in 1947. These plants are now being reactivated to produce 29,500 tons of magnesium in 1952. In 1951, production of primary magnesium jumped from 1,800 tons a month during the first quarter to over 6,000 tons a month during the last quarter, the total being 40,914 short tons. Rehabilitation of the Government-owned plant at Wingdale, New York, was completed during the last quarter and 10 of its 20 furnaces were in operation.

At present, both military and commercial uses of magnesium are broadening, particularly in the aircraft industry. A more thorough knowledge of the properties of magnesium alloys will increase the uses of this metal and lead to its substitution for metals that are more costly and in critical supply. Each B-36 superbomber utilizes 19,000 pounds of this metal in sheet form and for miscellaneous parts. Also, in the Douglas Skyrocket, the Sikorsky-55 helicopter, and in the commercial transportation field, a fast-growing market for magnesium is developing. At Madison, Illinois, the Dow Company has a new mill for rolling magnesium sheet which supplies a number of independent magnesium fabricators who are developing new uses for this light metal. The increasing demand for magnesium indicates an ingot volume of about 150,000 tons by 1960.

The total world output in 1950 was only 44,000 short tons, of which the United States produced 15,680 tons, the United Kingdom 5,500 and Canada 1,760. Norway planned to produce 3,000 tons in 1951 from seawater but neither from Norway or other foreign countries are production figures yet available.

GOLD, SILVER AND URANIUM

Fixed prices of $35.00 for gold and $0.90 for silver have severely handicapped producers over the past two decades since costs have risen and profits squeezed. The U. S. government closed down gold mines during World War II to free labor, while Canada permitted its mines to operate throughout the war. Meanwhile, gold and silver mines find it increasingly difficult to get good workers. Restoration of the gold standard with free convertibility of the dollar and gold is an essential step if financial integrity on the part of governments is to be regained. Now that the International Monetary Fund no longer bars member nations from taking independent action with regard to sales of gold on the free market, the prohibition by the U. S. Treasury on the sale of gold by U. S. producers becomes a particular restriction which should be removed.

GOLD—United States' gold production in 1951 was 1,957,543 ounces, 18 percent less than in 1950, the decline being general in all gold-producing states. The decline resulted from cessation of activity at numerous gold mining properties and curtailment at others because of the high cost of labor, unavailability of some supplies, and the fixed price for gold. Alaska was particularly hard hit and the 1951 production was 30 percent less than in 1950.

South Dakota maintained its rank as the leading gold producer, most of it coming from the Homestake Mining Company's mines. Utah was next on the list. California's gold output dropped 17 percent in 1951 as several dredges closed down and operations at the lode mines were curtailed. In Nevada gold production dropped 31 percent in 1951 due to the decline in straight gold mining and suspension of operations of the Goldfield Deep Mines Company. Gold from the base metal mines accounted for 60 percent of the total output.

Arizona was affected less as 72 percent of the gold is recovered as a byproduct of copper ore and the remainder largely from lead-zinc ore.

SILVER—The total U. S. silver production in 1951 was 39,463,661 fine ounces, Idaho supplying 37 percent, Utah 18, Montana 15, Arizona 14 and Colorado 7. In comparison with 1950 output, the average decline in the principal producing states was 8 percent.

The U. S. Treasury buying price for silver domestically mined remained at $0.905 per troy ounce throughout the year.

URANIUM—Search for uranium has continued on a worldwide scale in 1951. Highlights of the year's activities in Canada included preparations by the Eldorado Mining and Refining (1944) Ltd. to put its Ace mine at Goldfield, Saskatchewan, into production. The mill which will use a leaching process will have an initial capacity of 500 tons per day, scheduled to commence early in 1953, with every likelihood that this capacity will be rapidly increased. Several million dollars have been spent in the development work on a number of privately owned properties in the Goldfield area. Some of these will probably ship ores to the new plant, since exploration of small projects has been stimulated by Eldorado's announcement that the new plant would buy and treat customs ore. Underground development was continued at a fast rate in the company's principal mine on Great Bear Lake. Primary objectives of this work were to determine lateral and depth extensions of known ore bodies and to establish the location for a new internal shaft.

In the Union of South Africa, West Rand Consolidated Mines, Ltd. estimated that recovery of uranium from its new 40,000-ton-per-month West Reduction Plant will begin late in 1952. If arrangements are satisfactorily completed with the Atomic Energy Board of South Africa, the company will also undertake extraction of uranium from stockpiled slime residues of gold mills. Reported occurrences of radioactive materials in Baluchistant Hills have been receiving the attention of prospectors and geologists. New uranium extraction plants are being constructed by Western Reefs Exploration and Development Company Ltd., Blyvooruitzicht Gold Mining Company, Ltd., and Daggafontein Mines Ltd.

Several newly discovered occurrences of radioactive materials have been announced in Europe. In western Hungary near the Czechoslovakian frontier interesting deposits were announced early in the year. American engineers are reported investigating an occurrence near Wittechen in the Black Forest, and a West Berlin newspaper reports that residents are being evacuated from Saalfelt and Rudosstad to make way for 200,000 miners who will presumably undertake the mining of a uranium deposit recently discovered by Soviet geologists.

In Australia the mining of uranium ore began in Northern Territory in the Rum Jungle field during the year and activities continued at Radium Hill and Mount Pleasant. A new torbernite deposit was reported from Victoria in Gippsland.

In the United States, developments in radioactive minerals have continued at an accelerated pace. The Anaconda Copper Mining Company announced that its mill near Grants, New Mexico, which should be ready by April 1953, will treat ores from small shippers in the northwestern part of the state. New discoveries have recently been announced in the Laguna Indian Reservation where Anaconda has prospect rights. Shipments of ore are currently being made from the Grants area to the Atomic Energy Commission mill at Monticello, Utah.

A rush to Craven Canyon, near Edgemont, South Dakota, was the year's most dramatically heralded uranium discovery in the U. S. in 1951. On the Colorado Plateau and at Marysvale, Utah, development of orebodies continued with drilling and underground campaigns. Private enterprise and government agencies have been successfully exploring and developing uranium fields in the western states by newly developed scientific methods.

Phosphate rock producers in Florida and some of the western states have been actively cooperating with the U. S. Atomic Energy Commission in research aimed at recovery of the minute quantities (⅛ pound U_3O_8 per ton) of uranium contained in certain phosphate beds. While the percentage is admittedly very low, the aggregate recovery potential from an annual 10,000,000 tons phosphate rock production is substantial.

NONMETALLIC MINERALS

SULPHUR—Nonmetallic minerals had a good year in 1951 with sulphur perhaps occupying the largest spotlight. Although a new U. S. sulphur production record was made in 1951 with a total of approximately 6,000,000 long tons or 200,000 tons more than in 1950, it was estimated that this was about one-fifth less than potential consumption. Of this 5,300,000 long tons was elemental sulphur, 425,000 tons from pyrite, and 275,000 tons from smelter gases and other sources. Mine shipments dropped from 5,500,000 long tons to 4,990,000 long tons. More than 50 projects to develop sulphur have begun since the beginning of the Korean war. These are distributed among nearly 20 countries and within the next two years may contribute as much as 3,000,000 tons per year to world supply.

PHOSPHATE—Production continued its rise during the year. The U. S. industry continued to expand and it expected to stand at about 5 to 8 percent over the 11,100,000-ton total of 1950. Activity was intense in the North African producing areas and a marked rise in production is expected in the Pacific Ocean area.

POTASH—The other mineral fertilizer potash also saw stimulation during 1951. U. S. production totalled about 1,400,000 tons, and 1952 should show a further increase as the development programs of both the Duval Sulfur and Potash Company and the Southwest Potash Corporation, amounting to an investment of several million dollars each, will be completed during 1952 when the mines will be in full production. Also the United States Potash Company and the International Minerals and Chemical Corporation are expanding their operations. Canadian interest resulted in the first permit issued there to explore for and develop potash; new interest was manifested in Spain's enormous deposits; England contemplated an exploration program in Yorkshire; and work went forward in Germany on the well-known deposits of that country, most of which are now under Russian control.

FLUORSPAR—Production of fluorspar in the United States in 1951 was 341,877 tons, an increase of 17 percent over 1950. The 1951 breakdown was 173,772 metallurgical, 42,890 ceramic, and 125,215 acid-grade. Total consumption in 1951 was 495,561 tons, an increase of 69,000 tons over 1950. Consumption of acid-grade alone increased from 125,000 tons in 1950 to 152,000 tons in 1951 and will probably reach 200,000 tons in 1952. Had adequate supplies been available, consumption would probably have been greater. The Ozark-Mahoning Company is building a new flotation plant at Northgate, Colorado, and the Zuni Milling Company is now treating 4,000 tons a month at its flotation plant at Los Lunas, New Mexico.

MINERAL EXPLORATION

In the field of mineral exploration, the electrical and radioactive airborne methods have been developed to a greater degree of precision and sensitivity than was anticipated, particularly in the gas and oil fields. Carl Lundberg of the Lundberg Explorations Ltd., has kindly supplied the following notes:

"A number of airborne surveys have been made with scintillation counters and the advantages over the Geiger instruments may best be described as follows: Airborne gamma ray scintillation detectors employed at altitudes of 150 to 300 feet give counting rates of 200 to 300 gamma counts per second over average countryside. When these counts are integrated over optimum time intervals, such instruments make gamma count rate variations statistically valid at aircraft velocities; achievements which are not possible with the Geiger counter. At the same time, the counting rate is so effective that the cosmic ray contributions become proportionately so low that they can be completely neglected.

"In northern Saskatchewan, Colorado, and Utah, airborne surveys were carried out for uranium with these methods and have been very successful. This has come as a surprise to many of the experts who have been working with these methods for a long time, and I am very glad that we were able to show them that it works. The methods are just as effective in the air as they are on the ground; moreover, the cost per acre with the airborne methods is only a fraction of the cost of ground methods. As to the time required, this example will illustrate in three days we surveyed, in detail, a territory of 100 square miles which would have taken three field seasons with ground methods.

"Electrical resistivity surveys were carried out for the first time in the Yukon Territory where it had been thought that electrical methods were unworkable due to layers of permafrost. These surveys, however, were successful in locating veins of lead-bearing minerals. Airborne magnetic surveys have been carried out in Sweden where many thousands of square miles have been covered. Flights have been made at different altitudes for the purpose of determining the depth of many of the Swedish magnetite deposits."

Geophysical activities of the United States Geological Survey in 1951 included about 21,000 miles of airborne magnetic surveys and 10,000 miles of airborne radioactivity traverses. Of special interest was the survey in northeastern Minnesota over the Duluth gabbro, following the discovery of nickel-copper mineralization in the gabbro near its contact with the intruded slates. The Geological Survey used geophysical methods with success in locating supplies of ground water in California, Idaho, Ohio, and New York.

Of interest in the field of diamond drilling is the research work on the orientation of diamonds in drill bits being carried out by the Mining Research Branch, U. S. Bureau of Mines, at Mount Weather, Virginia. Wing G. Agnew states that by careful orientation of the diamonds the drilling performance of the bit is increased and the diamond loss per unit of work performed is greatly reduced. Results of this preliminary research are published in U. S. Bureau of Mines *Report of Investigations 4800*. Also, diamond drill research has been in progress since late 1949 at the School of Mines, University of Minnesota.

MINING METHODS

One of the present day problems in mining is to produce low-grade ores at costs below their actual value, and, at the same time to meet the increasing wage demands of labor. This is being done by introducing bigger and better mechanical equipment, both underground as well as for surface mining, and by making improvements in methods of drilling, blasting, loading, and transportation, as well as in roof support and safety practice. The miner and mucker of the past who were paid a few dollars a day have been replaced largely by skilled labor paid a few dollars an hour.

In underground stoping operations a few years ago, diamond drills were used for drilling long holes to eliminate, in part, the more tedious work in operating the mounted rock drills and to reduce the amount of development work required for short hole operations. The diamond drill is now being superseded by percussion drills using tungsten carbide bits which permit full gauge holes a few hundred feet long to be drilled without change of bit at lower costs. At the mines with large ore bodies the use of the percussion drill mounted on column and arm is disappearing and the jackleg, rubber-tired, jumbo mounting is taking its place. An increasing number of underground portable compressors are being used and the Joy Manufacturing Company has developed a drill jumbo on which the air compressor is mounted. The advantages are increased air pressure at the drill at a lower cost and saving in pipelines and labor cost because of the ease with which the jumbo can be handled and moved at the time of blasting and rock moving.

Research in drilling methods such as jet piercing, rotary and high frequency, and high-energy vibration methods are being investigated and may result in lower cost of underground drilling in the future.

In place of the detachable tungsten carbide bits and the steel detachable bits, the Hudson Bay Mining and Smelting Company at Flin Flon, Canada, are obtaining better results by using tungsten carbide tipped shanks. They give the cost per foot drilled with these shanks at 7.99 cents, as compared with 14.49 cents with the detachable carbide bit and 8.18 cents with the detachable steel bit. Carbide-tipped shanks resulted in a notable overhead saving due to the faster speed obtained in mining. The average cost of preparing a carbide-tipped shank is given as 5.87 cents.

For long holes, one-inch drill steel bars and 1⅝ inch carbide-tipped shanks are being used and are replacing diamond drilling in particular locations.

In blasting research, no new explosives for underground use are reported, but tonnage broken per pound of powder continues to decrease due to better technical practice and supervision. Wing G. Agnew, U. S. Bureau of Mines, states that the experiments in blasting raise rounds and 7 by 7-foot horizontal heading rounds with millisecond delay electric caps is continuing. A 9 by 9-foot horizontal heading is being prepared in which to carry on further experiments. When tests are completed, data will be available on the use of millisecond delays in two sizes of development headings for both direct interpretation and for comparison of results.

Research in underground pillar support by the U. S. Bureau of Mines and by Professor Philip B. Bucky at Columbia University on methods of direct measuring of stresses in pillars and roofs will result in more precise determination of pillar size, greater safety, and lower costs. On roof-bolting technique, the Bureau of Mines is cooperating with the West Virginia University to get actual operating results from the coal companies and their methods of testing pressures and torque needed to pull strata together without causing the roof rock to crush.

For underground transportation, train haulage is being replaced more and more in metal mines by the conveyor belt, resulting in lower costs than with track and train and more efficient operation and labor savings. This is particularly true at Inland Steel, Oliver and Pickands Mather mines on the Mesabi

Range, also at the Miami Copper mine in Arizona.

In mine hoisting developments, Nordberg Manufacturing Company has designed an operator's console so that operation of the control levers is no longer an effort as were the longer levers formerly used. The console contains all the instruments, switches, and levers for the operation of a Nordberg mine hoist. In addition to this, Nordberg has developed and incorporated in the console the new Micrometer Depth Indicator. It is located directly in front of the operator and is so accurate that "drum marks" on the drum flanges are no longer necessary for spotting the skip or cage at the landings. The drive for these indicators is from the respective drums and is accomplished through shafts and gears.

Ore Treatment Methods

An extra-heavy-duty, 60-inch, Nordberg gyratory crusher has recently been installed at the Climax Molybdenum Company's mine in Colorado. Also, far above the Arctic Circle at Kirkenes, Norway, a 54-inch, heavy-duty, Nordberg crusher, 7-foot Symons cone-crushers, rod deck screens, and wet grinding mills are being installed by the Sydvaranger Company for processing taconite iron ores.

The Allis-Chalmers Manufacturing Company have developed a Superior cone crusher and are providing two 70-inch and one 65-inch crushers for taconite processing on the Mesabi Iron Range. Two 84-inch and one 60-inch Hydrocone crushers are already in operation on taconite ore.

A letter from the Marcy Mill Division of the Mine and Smelter Company reports as follows:

"Recently some very prominent milling installations throughout the mining world were made, and selected for these important operations were Marcy ball and Marcy rod mills.

"Such companies as International Nickel Co. of Canada Ltd. for its new Creighton mill, Chile Exploration Co. for its copper concentrator in Chile, and the Oliver Iron Mining Company for its new taconite development, selected 10-foot 8-inch inside diameter Marcy ball and Rod mills for their important mill installations.

"Also, additional 10-foot 8-inch inside diameter Marcy ball mills were ordered for the new Bisbee development of the Phelps Dodge Corporation. The order was based on 10 years' operation of 27 of these Marcy ball mills at their Morenci operation. At the Greater Butte Project of Anaconda Copper Mining Company eleven 9.5 by 12 foot Marcy open end rod mills are now operating as fine crushers.

"Constant investigation and development goes on to keep abreast of manufacturing advances and improvement of wearing parts for Marcy mills. This has made them outstanding pieces of grinding equipment due to the low pulp line method of operation, accounting for high capacity and efficiency of these mills.

"Field test work goes on continually as new metals are developed for wearing parts, as well as tests on so-called ball segregation, speeds, and circulating loads, to keep operating costs for these milling plants at a minimum.

"Often times one is surprised that field tests do not verify theory, or statements, and claims made as to certain design features effecting the efficiency and capacity of grinding equipment."

For fine grinding, the Tricone mill is the outstanding development of the Hardinge Company. Harlowe Hardinge states as follows:

"The Barvue Mines in Canada ordered four 11-foot-diameter Tricone mills, each to operate with a 600 rpm. motor for grinding their zinc ore from about ⅜-inch feed to either 65- or 100-mesh, as conditions demand. The selection of the Tricone mill was predicated upon its ability to handle efficiently single-stage reduction because of its ability to segregate the major portion of the balls so that most of the larger balls are at the feed end where the coarse feed enters the mill, thus proportioning the ball size to the average particle size going through the mill, with the net result of having a greater impact action on the coarser sizes and more grinding surface available at a lower peripheral speed near the discharge end where the smaller balls with their greater surface area are maintained."

A letter from the American Cyanamid Co. states that:

"In the field of concentration of coarser sizes of minerals, HMS continued to make gains and many new plants using this process were placed in operation or under construction treating a wide variety of ores, including iron ore (22 plants) base metal sulfide ores, fluorspar, magnesite, brucite, garnet, spodumene, andalusite, chromite, tin, manganese, and gypsum, as well as gravel for concrete aggregate and coal (42 plants). Yearly tonnage treated by HMS now exceeds 55,000,000 tons.

"Also that the relatively new Dutch State Mines cyclone

separator processes for treating ores and coal in the size range of ⅜-inch to about 65-mesh was investigated on a commercial scale on the Minnesota iron range in 1951. During last summer M. A. Hanna interests operated a 120-tons-per-hour cyclone separator plant at the Buckeye mine. Later in the summer, Cleveland-Cliffs Iron Company also started a cyclone separator at the Holman mine. From the successful operation of these plants, a great deal of valuable data have been accumulated and it is anticipated that many more plants will investigate this unique process for iron ore benefication; also for treatment of other types of ores and coal. Already, two additional Dutch State Mines plants are expected to be in operation on the Iron Range in 1952.

"In the field of flotation, the sulphur shortage has stimulated interest in production of pyrite and pyrrhotite by-product from tailings formerly sent to waste. In this connection, Vermont Copper Company is installing the necessary additional equipment to recover, by flotation, pyrrhotite concentrate from current flotation tailing. Another new development that shows promise in the relief of the sulphur shortage is the interesting process of Chemical Construction Company. This process is applicable to low-grade (15 percent) elemental sulphur ores of the disseminated type, and involves a combination of autoclaving, screening, grinding and froth flotation. A plant employing this process is under construction in Colombia. The process gives high recovery of sulphur in a finished product of high purity.

"Scheelite flotation continued to be of interest and Getchell Mines Inc. and Nevada Scheelite Inc. were new producers in 1951. Cyanamid's new reagent S-541 shows interesting possibilities for scheelite and is in use at one of these plants.

"In the field of hydrometallurgy, perhaps the most interesting development in years is the process developed by Chemical Construction Company for treating copper-cobalt-nickel ores and concentrates. This process will be used in a plant to be erected to treat concentrates produced from treatment of copper-nickel ore at the Lynn Lake, Manitoba property of Sherritt-Gordon Company."

The increasing use of Humphreys Spirals in 1951 are indicated by the following statements kindly supplied by the company.

"On the Mesabi Range in Minnesota, a plant consisting of 216 spirals was installed and operated for the recovery of minus-10-mesh iron values. These were recovered from one of the many existing tailing ponds. Also on the Mesabi Range two new spiral plants, consisting of 60 spirals each, and one of 108 spirals were started.

"In New York State a large plant of 144 spirals will begin operation early in 1952 for the recovery of martite, a nonmagnetic iron mineral.

"A large spiral plant—256 spirals—was shipped to West Africa for treating fine specular hematite ore.

"Climax Molybdenum Company increased its spiral capacity from 128 to 368 spirals for recovery of tungsten, tin, and pyrite from the regular molybdenum flotation tailing."

STOCKPILING

As recommended in the 1950 Accounting, the U. S. must forget stockpiling solely for rearmament, and embrace a program aimed at national security. Metals and mineral products from countries which are bound to the U. S. by political and trade ties must receive permanent preferential favor. Imports from these countries will continue indispensible if we are to maintain emergency stockpiles and supply normal peacetime activities.

At this date figures showing the current shortages of metals are not available, but in 1950 output of tin and lead was well above consumption, while consumption of copper, aluminum, and zinc surpassed production. During 1948, 1949, and 1950 metals stockpiled by the U. S. government resulted in throwing the market out of balance. Approximately 5 percent of the copper, 5 percent of the zinc, 8 percent of the lead and 21 percent of the tin appearing on the world market went to that purpose.

Although zinc production has increased about threefold, copper four, lead about 2.5, and aluminum 170-fold since 1900, the world still has not enough assured production of any one of these metals to satisfy the demands of either peacetime industries or rearmament needs.

During the year in review some metals, among them copper, lead, zinc, and aluminum, were withdrawn from existing U. S. stockpiles or diverted to the rearmament plants before reaching the various stockpiling depots. These diversions from in-transit shipments were made with the understanding that an equal amount would be restored to the stockpile before specified dates.

One of the most valued assets a nation may possess is a wealth in minerals and private capital for their exploitation. National security demands a well-integrated mining industry supplemented by efficient manufacturing and marketing facilities. Experienced management, miners, good equipment, and public services to keep them in operation are essential. Stockpiling is an efficient and advisable procedure to absorb the surplus during periods when production exceeds consumption, but it remains in the national interest to divert purchases from stockpiles when shortages of metals dislocate production.

DEFENSE AGENCIES

A good deal of justified fuss was made in the U. S. Congress about the duplication of government agencies that deal with minerals, and the lack of progress in carrying out the authorized mineral program. As a result, the President issued an order last summer consolidating some of the principal portions of GSA, DMA, ECA, and DPA, under the new Defense Materials Procurement Agency, headed by Jess Larson, former administrator of GSA.

Competent men from mining and metal fields outside the government were selected to head the various divisions and are keeping close control of the program, but prompt action in granting aid to producers is still lagging. The months of delay to get project approvals have been due in part to the lack of cooperation between the various agencies involved. This new organization now has Howard Young as Deputy Administrator and James Douglass as Assistant Deputy Administrator. With competent staff officers now in charge of the United States and Foreign Expansion Divisions, a real speed-up is anticipated. The responsibility of DMPA is to procure from world markets the materials in short supply necessary to carry out our defense requirements and the fulfillment of our stockpile objectives.

The ECA was dissolved on December 31st, 1951, and its strategic materials division, headed by Charles Stott, was taken over by DMPA. Other functions of ECA are now under the Mutual Security Administration headed by Averill Harriman. The Defense Minerals Administration, now the Defense Minerals Exploration Administration, remains in the Department of Interior under the direction of Clarence Mittendorf. Its function is to carry out the program of aid to mineral exploration projects within the U. S. The GSA is still responsible for stockpile procurement, while DMPA acts as the sole government-procuring authority for nonagricultural materials.

Under the Defense Procurement Act, Congress offered specific aids to the mining industry in the following forms: (1) accelerated amortization which will provide tax relief for new and expanded production; (2) procurement contracts with a floor price and a time period to be determined by negotiation; (3) loans where private financing is not available; and (4) matching funds for exploration work. Most of these aids are now being granted by DMPA. DPA has the authority to regulate the mining industry during the emergency by means of allocations and price controls, wage and salary stabilization, taxes and similar devices.

TAXES AND TARIFFS

A special tax on mining at any time is deplorable since it is directed at the men who carry the risk inherent in mining development. Expansion of the industry is achieved largely by investors who are willing to risk new money in mining ventures. Without the activities of these individuals new mines would not be developed or plants expanded. Because of the high taxes wherein the government takes 75 to 90 percent of the return from successful mining ventures, active interest in new mine developments in the United States is lagging.

However, new life is being injected into the industry by allowing shorter periods for amortization of investment. Instead of taking depreciation deductions as prescribed by law, taxpayers may elect to amortize the property over 60 months, providing the investment was completed after December 31, 1949, and that it has been certified as necessary for the national defense. Congress has been called upon to recognize that one of the greatest incentives that can be given to the industry today would be an increase in depletion allowance; also, that provision be made to write off expenses incurred in prospecting, exploration, and development. So critical is the problem in the U. S. that search for sulphur and potash is largely dependent upon legislation concerning tax rates.

The U. S. Revenue Bill of 1952 made the following stipulations regarding nonmetallic mining: A 15 percent rate applied to borax, Fuller's earth, tripoli, quartzite, diatomaceous earth, metallurgical, and chemical-grade limestone, and perlite. A 10 percent rate applies to wollastonite, asbestos, dolomite, and magnesite, and a depletion of 5 percent for sand, slate, gravel, stone, and other building materials.

In certain foreign countries, such as Mexico, Chile, and Bolivia, high export taxes are levied on most mineral products, in addition to a production tax, and numerous social benefit taxes. Exporters are also obliged to exchange dollars received in

payment for products at rates considerably under the current rate of exchange which constitutes an additional tax.

Early in 1951, the U. S. Government went on record as favoring tariff concessions and increasing the number of nations enjoying tariff concessions from the U. S. These items were set forth in the Torquay, England, tariff concessions agreement.

As a result of the last conference the life of the Agreement was extended three years from June 1, 1951 and the present roster of member nations represents over 80 percent of the world import capacity and 85 percent of the world export capacity.

BORDER BARRIERS

The U. S. mining industry is now facing a situation of greater demands for minerals and depleted ore reserves. We are in a new kind of world with political barriers and "iron curtains" preventing access to foreign mineral sources. These barriers may become higher unless early action is taken. It is in the world beyond our borders that we must now seek some sources of mineral supply. The most feasible foreign sources are old mines, many of which can be made profitable using modern methods, and mining districts still unexploited where geological studies may reveal ore deposits which may become important when the problem of transportation is solved.

Border barriers between countries not only cause much delay and often prevent the normal flow of metals and minerals, but discourage investment in mine development.

Canada has tax laws that eliminate all taxes on new mine developments until in actual production and that give many other advantages to invite rather than deter capital for mining investments. Canadians realize the value of a thriving mining industry and legislate accordingly. It is said that more prospecting and mine development is underway in British Columbia than in the entire U. S. west of the Mississippi. Peru has also set a good example in this respect by a new mining code which exempts new mine developments from taxes for a period of years and does not apply restrictions on the export of profits. Important new mine developments in Peru are now being financed by outside capital.

In certain foreign countries, there is a tendency toward industrial nationalization, thus bringing politics into the picture. This usually results in incompetent management and waste, and in some cases competition with private industry. It is because of the political instability in certain countries that mining companies hesitate to risk capital and technical ability on otherwise promising mining ventures in those countries.

POINT IV AND MINERAL DEVELOPMENTS

Following President Truman's Inaugural Address in 1949, Congress passed legislation establishing the Technical Cooperation Administration within the Department of State, and provided $34,500,000 and $46,333,000 in fiscal year 1951 and 1952, respectively, to carry on the Point IV Program. The objective of Point IV was defined by the U. S. Congress as follows:

> "It is to be declared the policy of the United States to aid the efforts of economically underdeveloped areas to develop their resources and improve their working and living conditions by encouraging the exchange of technical knowledge and skills and the flow of investment capital to countries which provide conditions under which such technical assistance and capital can effectively and constructively contribute to raising the standards of living, creating new sources of wealth, increasing productivity and expanding purchasing power . . ."

Point IV mineral projects are wholly devoted to technical assistance performed in cooperation with other governments, and have no direct responsibility for procurement. The objective of the program is to impart skills and know-how directly to the peoples of industrially underdeveloped countries. However, in a field as fundamental and basic as that of mineral resources, any progress results in increased production and, therefore, Point IV does provide an additional supply of mineral raw materials to the markets of the free world.

The minerals program of Point IV are staffed and managed by two agencies of the Department of the Interior, namely the U. S. Bureau of Mines and/or the United States Geological Survey. Fundamental geological and geophysical investigations which are indispensable for discovery of mineral deposits are performed by the Geologic Survey. The Bureau of Mines takes responsibility when the programs require the technical services of a mining geologist, mining engineer, ore dressing technician, metallurgist, utilization technician, or marketing expert.

Under the Point IV program, the governments should limit their activities to field surveys and studies of ways and means to utilize dormant mineral resources. In the preparation of projects for mine and metallurgical plants, private engineering firms with specialists experienced in the particular type of undertaking should be engaged and the exploitation of the project should be undertaken by private enterprise.

In the underdeveloped areas the geologists and mining engineers will make reports on new sources of mineral supply worthy of large capital investment. As local private capital is usually not available in the required amounts, considerable dependence will necessarily have to be made on the introduction of private capital from foreign sources. The stimulation of the flow of private capital into these undeveloped areas should, therefore, be the second facet of the Point IV program. But the real solution is for our government to encourage the greatest use of the large supply of venture capital and technical know-how in the hands of domestic mining companies and to protect the investor in a foreign mining venture in case foreign governments are unjust in their dealings or impose discriminatory measures upon them. This is the duty of the State Department, which in the past has rarely taken any interest in protesting to foreign governments against confiscatory and other unjust measures imposed upon private U. S. interests abroad.

Before giving Point IV aid to a foreign country, we now have the opportunity to insist upon having definite agreements for the encouragement and protection of private investments in mining enterprises abroad, and, in case capital is needed, the country involved should guarantee the investor against confiscation, permit convertibility and export of profits, and allow freedom from taxation until such time as the properties are in production.

CONCLUSIONS

The metal industries have now entered a stage of accelerated activity arising from the development expansion in backward countries and their demands for a higher living standard as well as the growing increase in world population. Upward trends in consumption of most metals are becoming more pronounced. Copper production is now four times that of 1900, zinc three times, aluminum 170 times, as its production did not get a real start until 1890.

Also, the pattern of consumption is changing and the light metals—aluminum, magnesium, and titanium—for which the raw materials are more abundant are gradually replacing the heavier metals as costs of production are being lowered. Plastics have already become an important competitor to metals, and the recovery of scrap metals is attracting greater interest as metal prices increase.

The present metal shortages have been aggravated by defense needs and civilian hoarding. This situation may continue for some time but producers naturally fear a sudden return to a normal state of affairs or even an industrial depression, thus leaving them with large investments in plants and little demand for their products.

To alleviate this, the government has in some instances made long-range purchase contracts which guarantee a floor price on government purchases. On the other hand, the world, and in particular the U. S., is faced with a shortage of metals. But as per capita consumption of metals and consuming populations are on the increase, the question of supply and demand appears to favor a continuing demand for metal products during the next decade.

To meet this demand, private enterprise will have to take on the job of developing new sources of supply, not only here at home, but in the important mineral fields abroad. United States venture capital, as well as foreign capital, hesitate to do so because of the border barriers, such as the never-ending tax increases and discouraging exchange regulations which interfere with the flow of trade and investment in the mineral industries.

The problem of urgent importance is to bring pressure through influential groups upon the local law-makers of foreign countries, as well as in our own country, to review and revise the existing confusion of decrees that apply to mineral industries, such as tariffs, export taxes, and controls on export of profits, import taxes, income taxes, amortization and depletion allowances, foreign exchange regulations and rates and limitation on foreign control of mining enterprises.

It is pleasing to note that Peru last year issued a new mining code modeled after that of Canada which favors investment in mines by exempting new mines from taxation for a period of years and other benefits which have been responsible for the vast development of mineral resources which are the basis of Canada's remarkable economic expansion. A corresponding result is anticipated in Peru. The mineral resources of a nation represent money in the ground which, if dug, could bring wealth to the nation and benefit to its population. These resources are useless if left dormant. Let us hope that the government lawmakers in other countries will be made to realize these facts.

The authors wish to express their thanks to all the U. S. Bureau of Mines commodity specialists who gave time and thought in reviewing and supplying many of the data presented and to Lester Morrell of the Bureau of Mines for his critical reading of the manuscript of this article.

METALS AND MINERALS REVIEW

ALUMINUM

By KEEN JOHNSON
Vice President
Reynolds Metals Company
Louisville, Kentucky

The aluminum expansion program now under way in the United States is the most extensive that has ever been undertaken and will result in doubling the nation's productive capacity of aluminum in three years. In 1950 the capacity to produce primary aluminum was about 1,500,000,000 pounds in the United States. By the close of 1953 that capacity will have been increased to approximately 3,000,000,000 pounds.

During World War II facilities to make aluminum were expanded by private industry which added 608,000,000 pounds to the annual output. The federal government built plants with capacity to produce 1,300,000,000 pounds.

All of the new capacity has thus far been privately financed. The cost will total about $700,000,000, including auxiliary power and alumina plants.

All the new capacity since Korea created the need for expansion is expected to operate economically and permanently after the military defense needs ends. About 60 percent of the World War II government plants were classified as "war babies." Thirty-five percent of that capacity was cannibalized and those plants no longer exist; 16 percent was dismantled and relocated by private producers; eight percent is being operated on a temporary basis under a Government stockpile contract with the Government paying the excess power costs.

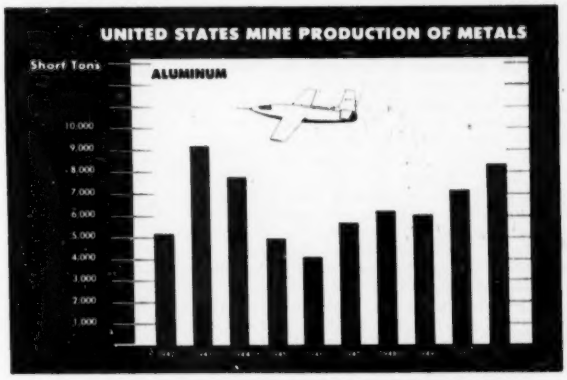
Reynolds Metals Company and Aluminum Company of America are increasing their bauxite mining operations in this area. Alcoa has extensive bauxite deposits in Dutch Guiana, South America, where its operations are being expanded.

Reynolds Metals Company is expending approximately $17,500,000 in developing its bauxite mining operation in Jamaica where the company has extensive reserves and expects to start its Jamaica operations this spring.

Primary Aluminum Plant Capacities in the United States Measured in Millions of Pounds (1)

Company and plant location	*In operation December 1951*	*To be completed in 1952 and 1953*	*Total*
Aluminum Company of America			
Regular Operation			
Alcoa, Tenn.	290.6		290.6
Vancouver, Wash.	152.2		152.2
Massena, N. Y.	115.0		115.0
Point Comfort, Tex.	114.0	70.0	184.0
Badin, N. C.	67.7		67.7
Wenatchee, Wash.		170.0	170.0
Rockdale, Tex.		170.0	170.0
Total—Regular	739.5	410.0	1,149.5
Temporary Operation (2)			
Badin, N. C.	19.0		
Massena, N. Y.	29.0		
St. Lawrence, N. Y.	110.0		
Total—Temporary	158.0		158.0
Total—All Plants	897.5	410.0	1,307.5
Reynolds Metals Company			
Jones Mills, Ark.	194.0		194.0
Troutdale, Ore.	165.0		165.0
Listerhill, Ala.	100.0		100.0
Longview, Wash.	63.0	37.0	100.0
Corpus Christi, Tex.		160.0	160.0
New Arkansas Plant		110.0	110.0
Total	522.0	307.0	829.0
Kaiser Aluminum and Chemical Corporation			
Mead, Wash.	300.0	40.0	340.0
Tacoma, Wash.	50.0		50.0
Chalmette, La.		400.0 (3)	400.0
Total	350.0	440.0	790.0
Anaconda-Harvey Copper Mining Company			
Kalispell, Mont.		144.0	144.0
Grand Totals	1,769.5	1,301.0	3,070.5
Total Regular Capacity (excluding temporary)	1,611.5	1,301.0	2,912.5

1. Two types of capacity figures are frequently used: rated capacity and operating capacity. Some plants can and do exceed their rated capacity, depending primarily on their power supply and power equipment. For example, rated capacity of Reynolds plants by 1953 will be 810 million pounds. The 829 million pound capacity figure used in this tabulation is based on actual operating performance of plants already in operation plus rated capacity for plants under construction. If the new plants also exceed their rated capacity the operating capacity figure should then be raised.
2. Alcoa is operating 158.0 million pounds of capacity (not considered economical for lack of cheap power) under a special stockpile contract whereby the Government pays power costs in excess of 5 mills per KWH.
3. Initial unit went into operation in December 1951.



Kaiser Aluminum Company also has bauxite in Jamaica and is installing mining facilities.

All of the existing alumina plants are being enlarged. These include Alcoa plants at Mobile, Alabama, and East St. Louis, Illinois; Kaiser plant at Baton Rouge, Louisiana, and Reynolds plants at Hurricane Creek, Arkansas.

The expanded production of aluminum makes necessary enlarged alumina facilities. In order to meet this need Alcoa is building a new alumina plant at Bauxite, Arkansas and Reynolds Metals Company is building a new plant at Corpus Christi, Texas.

All the new plants designed to increased aluminum production are well located for profitable peacetime operation and they have also been so situated as to best meet National Security standards. Eleven different locations are being used for the new aluminum capacity. As a result, there will be production at 17 different places in the United States; the largest of the plants will produce only 13 percent of the nation's capacity.

In Canada more than 80 percent of capacity is concentrated in one plant at Arvida, Quebec. Canadians are building another plant in British Columbia which will be only 1,600 miles from Russian bomber bases.

ANTIMONY

By WORTHEN BRADLEY
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Bradley Mining Company
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This will refer to the supply and consumption of primary antimony, the figures for which (because of incomplete statistical returns) can only be estimated.

The year 1951 was not a particularly bright one for domestic antimony producers. Their production, at 3,350 tons, was up 46 percent from 1950; this figure contributing toward 1951's total domestic supply of 22,000 tons, a 12 percent increase over the prior year. Consumption was 18,000 tons in 1951, up 16 percent from 1950's 15,494, and 1951 ended with

domestic prices sagging below official ceilings (the latter having been clarified by an Office of Price Stabilization order of November, 1951).

Contributing to the 22,000-ton total of 1951's domestic supply, in much greater measure than domestic production, were the 15,600 tons of imports. The 10 major sources of these imports, in relative order, were Mexico, Bolivia, Union of South Africa, United Kingdom, Canada, Chile, Belgium-Luxembourg, Peru, Yugoslavia, and France. Shipments from Yugoslavia and the United Kingdom were increasing toward the end of the year, following the long-awaited settlement of the domestic price ceiling.

Domestic consumption in metal products proved one of the 1951 disappointments. The figure was down sharply from 1950 and preceding years. But increased requirements for antimony oxide, in the flame-proofing of textiles and in fire-retardant paints, resulted in a brighter side to the consumption picture. Use of primary antimony in these and other nonmetal products was up about 60 percent over 1950.

The Yellow Pine mine and smelter at Stibnite, Idaho, continued as the major domestic producer. It is expected that its output will be increased in 1952. Said output is nearly all in the form of oxide, but it is interesting to note that there is a growing market for Yellow Pine granulated metal (as opposed to the standard ingot form).

It is fairly easy to predict the trend of United States production, providing a strong domestic market exists in 1952. It is difficult, however, to forecast the component parts of the market. For instance, what will be the availability of foreign supplies? Many antimony deposits in our western states will remain undeveloped if the overhanging threat of such supplies continues, unprotected by an adequate tariff.

To speculate on the other side of the market picture, what will be the impact of military requirements? Will they become so large, here and abroad, that a scramble for world supplies will ensue? If so, European consumers will be in a position to outbid their U. S. counterparts. The Europeans will be aided by the U. S. Government's policies of price ceilings and 60-day inventory limitations (only two of the many government orders affecting antimony).

Which leads up to a quotation from the Survey on Antimony compiled for the National Security Resources Board and released in March, 1951. On page 11 of its summary is this paragraph:

> "It would be necessary to have at least a year's supply of primary antimony stockpiled in the United States, and more, if possible, to maintain a steady flow to consumers and as a protection against labor difficulties and a shipping shortage which might develop. However, it is doubtful if this stockpile could be built up after the emergency developed, therefore, the most logical plan would be to stockpile in advance."

It would be an opportune time for the U. S. government to act on this "logical plan." The industry believes that antimony already stockpiled would be insufficient in an emergency, and the U. S. Bureau of Mines (which prepared the NSRB report) evidently concurs in this belief. A resumption of government purchasing would not only justifiably enlarge the stockpile but would, by tieing in solidly with the government's fine program of exploration assistance (now in operation), help and encourage antimony producers—both actual and potential—at a time when they are in need. They and their product will surely be wanted in the future.

THE ATOM

BY THE STAFF OF THE UNITED STATES ATOMIC ENERGY COMMISSION'S RAW MATERIALS OPERATIONS OFFICE

The United States Atomic Energy Commission took two steps in 1951 designed to encourage the expansion of current production and to increase development of new uranium mining properties. In March it established a new bonus for initial domestic uranium ore production and a price increase for carnotite-roscoelite type uranium ores from the Colorado Plateau as substantial additional incentives for uranium mining in the United States.

The year saw increased activity in exploration, discovery of new deposits and potential areas of production, and extension of the older areas of production, both geographically and geologically. The number of processing plants increased from six to eight, with construction to start on the ninth mill near Grants, New Mexico.

The guaranteed minimum base prices for uranium oxide content of carnotite-roscoelite type ores of the Colorado Plateau were increased on March 1, 1951. The price raises enabled Colorado Plateau miners to meet increases in the cost of mining which had occurred since the Commission's domestic ore buying schedules were established in 1948 and also provided substantial additional incentives to search for and operate uranium mines.

The base prices paid for uranium oxide content in ores were increased on a graduated scale from 175 to 300 percent over the previous bases. In addition, the premium paid on ores containing more than four pounds of uranium oxide to the ton was increased from $0.25 to $0.75 per pound.

The exploration program during 1951 was greatly expanded over 1950. A drilling rate of nearly 750,000 feet per year was reached, nearly doubling that of 1950. Approximately 1,200,000 feet of drilling is planned for 1952. Extensive geologic investigations were carried out by field parties during the year. Prior to contracting the drilling, detailed mapping and geological surveys are necessary. Numerous access roads were built and water supplies developed in connection with establishing the various drilling camps. Under the Federal Aid Highway Act of 1950, the AEC is assisting in the planning of a program for the construction and improvement of access roads which will help to open up potential uranium producing districts in the Colorado Plateau area.

Underground exploration, consisting of drifting, cross-cutting and raising as well as underground drilling, to develop geological information, and to investigate production possibilities, was carried out. Airborne radio-activity surveys using Geiger counters and scintillometers were made for the Commission by the Texas Company and the United States Geological Survey. Many of the anomialies recorded by the airborne equipment have been further investigated by ground reconnaissance and in at least one case, an entirely new area has been discovered which is expected to develop into an important producer. Gamma-ray logging of drill holes at a number of projects has proven a useful geological tool.

Exploratory activity during 1951 continued to point up the importance of uranium deposits which occur largely in a series of sedimentary rocks in the Colorado Plateau area. Until recently the major production was limited to a small area in western Colorado and, in particular, one type of ore the carnotite deposits of the Morrison sandstone. Production now comes from deposits scattered through a much larger geographic area, from several host formations and from several geologic types of deposits.

On the Colorado Plateau, U. S. Vanadium Company, Vanadium Corporation of America, J. R. Simplot Company, Minerals Engineering Company, Climax Uranium Company, Dulaney Mining Company, Sitton and Dulaney, Inc., in addition, to several other companies and many individual operators continued to mine ore and do development work in 1951. The total production from the small producers, while individually small, is significant.

In the White Canyon area of southeastern Utah; the Happy Jack mine continued to produce substantial amounts of copper-uranium ore in 1951. Shipments have also been made from numerous small operations. Activities in the San Rafael Swell, Capitol Reef, Silver Reef and Circle Cliffs areas of southern Utah consisted largely of prospecting and modest adit developments by private individuals. West of Moab, Utah, at Sevenmile Canyon, copper-uranium mineralization was uncovered last summer in the Shinarump Conglomerate. The increases in price and the acceptance of copper-uranium ores at Monticello, Marysvale and Salt Lake City, Utah are stimulating exploration and development of copper-uranium ores in these areas.

The Santa Fe Railroad continued intensive exploration on its properties in the Grants, New Mexico area. Important reserves of carnotite mineralization, occurring in the Todilto limestone have been delineated. Additional finds in sandstone beds as well as limestone have extended the favorable uranium area. A second company, Anaconda Copper Mining Company, entered the district early in 1951, secured extensive mineral rights, and has actively prospected its land, while carrying out a metallurgical testing program preparatory to constructing a mill to handle high-lime ores. In addition, a number of individual prospectors have been combing the area and locating claims on favorable open ground. The Anaconda Copper Mining Company has been designated by the Laguna Indian Tribal Council to carry out a detailed exploration program on their lands to the east of Grants.

Outside the Colorado Plateau area, carnotite deposits were discovered during 1951 in the Lakota, the newest member of the Dakota sandstone, near Edgemont, South Dakota. This led to considerable claim staking and further prospecting. There is considerable optimism over the possibility of this discovery opening up a whole new geologic area of carnotite deposition extending over a broad general area of the Dakotas. Wyoming and Montana.

Pitchblende occurs in several mining districts in the United States, but only the Marysvale, Utah district is producing

uranium in any quantity. At present, there are five mines in the central producing area. Vanadium Corporation of America has developed the Prospector mine, Freedom No. 1 and Freedom No. 2 mines. They are presently driving a long cross-cut on the 300 foot level of the Prospector which will explore the several vein systems in its properties. A vertical shaft is also planned in conjunction with the crosscut. Bullion-Monarch Mining Company has been carrying on open-pit operations and have driven over 1,000 feet of underground workings to date, in exploring extensions of the ore body at depth. The Buddy, leased by a local operator, has over 600 feet of exploratory workings.

Additional processing capacity was established during the year in the Colorado Plateau area. Two new plants are being operated, one by Vitro Chemical Company at Salt Lake City, Utah and the other by Climax Uranium Company at Grand Junction, Colorado. Vanadium Corporation of America has an experimental mill at White Canyon, Utah which it is planning to expand. Facilities were expanded at the Uravan and Durango, Colorado mills of the U. S. Vanadium Company, and Vanadium Corporation of America respectively, to increase their capacity.

An ore-buying station was built recently at Shiprock, New Mexico, and is being operated for the Commission by American Smelting & Refining Company. It will provide a market for ores produced on the Navajo Indian Reservation of Arizona. Ore buying commenced early in January, 1952. Consideration is also being given to establishing a processing mill there. As the year closed negotiations were concluded with Anaconda Copper Mining Company for the construction of a purchase depot and processing mill in the Grants, New Mexico area. Anaconda will build the plant at its expense, and will treat its ores as well as those of Santa Fe and other producers.

A contract has been entered into with a phosphate chemical company for establishment of byproduct uranium recovery facilities. Other contracts have been made with several phosphate chemical and fertilizer companies for operation of pilot plants in furtherance of process studies and eventual construction and operation of additional uranium recovery plants.

BERYLLIUM

By D. H. HERSHBERGER
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The most interesting note in a comparison of 1951 beryl statistics with those of 1950 is the fact that 449 tons were imported from India, the first since 1946. This, however, was not a commercial transaction as India's embargo on beryl exports is still in effect, but was the result of an inter-government agreement.

Africa played the dominant role in supplying this country for the first time with 54 percent of the total provided by the southern portion of that continent. Conversely, Brazil's decline was quite disappointing, causing a serious problem for the industry during the first half of the year. The temporary suspension of granting of export licenses resulted from study of the requirements of proposed processing in Brazil, but exports were resumed and it is anticipated that Brazil's consumption in the next few years will not exceed one-third of her production of beryl.

Based upon available information and discussions during foreign travel, it seems that very little beryl is consumed in other countries that are not inaccessible even though governments restrict exports in Argentina, Australia, Brazil, French Morocco, India, Madagascar and Spain. In general, these controls exist because beryl is a strategic mineral and potential future requirements are being protected. The United States consumption in 1951 was only three percent higher than in the previous year and enough less than the new supply to indicate that the Munitions Boards stockpile is progressing satisfactorily toward its goal.

On August 10, 1951, the OPS exempted sales of beryl, along with other critical metals and minerals, from price control. The price of beryl ranged from $26.00 per short ton unit of contained BeO, CIF New York, to $35.00 at the end of the year. This consistently rapid advance in the price of the hand-cobbed crystals brings nearer the economic possibility of obtaining mill-produced concentrates, particularly in the United States. Investigation work successful on a laboratory scale has been completed by the U. S. Bureau of Mines and is expected soon to develop into the operation of a mill for the separation of pegmatite minerals. This new source of beryllium ore will be required to augment the imported mineral supply as the demand for beryllium copper alloys continues to increase with the more widespread recognition of the value of its properties.

United States Receipts of Beryl in Short Tons by Countries for 1950 and 1951

Country of Origin	*1950*	*1951*[1]
Brazil	2,543	1,094
British East Africa	11	48
Canada	29	0
Finland	0	5
French Morocco	77	23
India	0	449
Japan	44	12
Mozambique	130	174
Portugal	28	98
Southern Rhodesia	464	691
Union of South Africa	1,401	1,722
United States	530	500*
TOTAL	5,257	4,816

[1] Preliminary; * Estimated

Progress has been made during the year in the refining of beryllium in that economical means have been perfected for the removing of impurities in the making of high purity metal. As the beryllium industry is in its formative years, research of this type is constantly being carried on.

CHROME

By FAY I. BRISTOL
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Grants Pass, Oregon

Available supplies of chromite during 1951 barely equalled the consumption in the United States. Imports accounted for more than 99 percent of the available chromite and of this amount, less than 2.5 percent was produced in the western hemisphere, in Cuba. So in case of an all-out emergency, the western hemisphere would be in a bad way for chromite.

In time of war, our greatest need is of metallurgical grade chromite. Turkey, who supplies us 50 percent of this grade, is the center of an area of great unrest, as exemplified by the recent riots in Egypt. Southern Rhodesia, which supplies most of the remaining metallurgical grade chromite, is somewhat better situated geographically, although during the first year of the last World War, enemy submarines were able to sink over 90 per cent of the cargoes of chromite from that country. Most other foreign producing areas supply chemical and refractory grade chromite.

In case of all-out emergency, the United States will be forced to fall back on domestic production so development of known reserves at this time is a wise move.

Known reserves in Montana could go a long ways in supplying needs of chemical and refractory chromite but this particular ore under present known methods of concentration and beneficiation, is most unsatisfactory for metallurgical purposes.

During the two World Wars, some metallurgical chromite was produced in Oregon and California and during the first nine months of 1951, some 1,287 tons of refractory grade chromite was produced in central California.

In August of 1951, a government stockpile for purchase of metallurgical grade chrome was set up at Grants Pass, Oregon. The actual opening of the purchase depot preceded the first winter snows by only a little over a month, but in that short time, a very substantial reserve of ore was developed and over 5,000 tons of metallurgical grade chromite was delivered in Grants Pass. This production was the direct result of a program which was recommended to the government by the Oregon Mining Association and the state mining departments of Oregon and California.

The program at present, limits production to 2,000 tons of ore per mine a year. This limit was not fully understood by the majority of potential producers some of whom have started extensive development and milling programs. There are now built or are a-building, in excess of 1,000 tons per day of mill capacity which will be producing 300 to 400 tons of concentrates per day in the very near future. Some 150 individual lump ore mines are actively being developed and they will start hauling as soon as the snows go off.

The grade of ore produced is equal to that of any imported ore and on the basis of the present development program if

actively carried out, 50 percent of our metallurgical grade ore can be produced in the states of Oregon and California. At the same time, contracts being let for foreign imports are reducing their specifications for metallurgical grade from 48 percent, 3 to 1 ratio, to 45 percent, 2.5 to 1 ratio.

DMPA is now confronted with the problem of whether to go all-out for domestic production during the next three years and find out actually what can be produced per year, or to limit production at each mining property. The decision made will have a tremendous effect on the amount of ore that will be developed, as no reasonable miner is going to spend money on development work when there is no market for his ore.

So far, miners have taken the attitude that the government will relax the limit of 2,000 tons per mine and many of them are embarking on development and milling programs which cannot be supported with a 2,000 ton production limit.

COBALT

By C. R. WHITTEMORE
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Deloro, Ontario

Cobalt metal claims a high priority in the free world requirements for defense and essential civilian requirements. During 1951, cobalt has been strong price-wise and in tight supply since it is under world-wide allocation. The United States NPA in classifying the non-ferrous metal requirements has placed cobalt in a group, comprising metals insufficient for defense and essential civilian demands and designated it as "most critical."

The chief sources of cobalt in order of importance are the Belgium Congo, Northern Rhodesia, Canada, French Morocco and the United States. Minor amounts are derived from pyrites and cobalti-ferrous products in Japan, Finland, Germany, Sweden, Italy and Australia.

A new copper-cobalt deposit at the Chibuluma property of Mufulira Copper Mines Limited in Northern Rhodesia has attracted international interest. The ore is believed to cont in over 5.0 percent copper and 0.25 percent cobalt. It will be some years before the mine can come into production.

The Kilembe Copper Mines, subsidiary of Frobisher Ltd. and Rio Tinto Company, has located an estimated 14,054,000 tons of copper-cobalt ore containing approximately 21,500 tons of cobalt in Uganda. A milling capacity of 3,800 tons per day is contemplated.

The Union Minière du Haut-Katanga in the Belgian Congo continues to be the world's premier producer. Output was 5,675 short tons in 1950. Union Minière at the Jadotville plant produces a crude cobalt alloy containing about 40 percent cobalt, 15 percent copper, 45 percent iron, which is shipped to refining plants at Oolen, Belgium and Niagara Falls, New York, for the production of metal, oxide and salts.

The cobalt in the copper solutions of the electrolytic copper plant is recovered by precipitation, re-solution and electrolysis to obtain cathode cobalt which is melted and granulated.

Rhokana Corporation, in Northern Rhodesia, is the second largest producer of cobalt, 1950 output being 739 short tons. During 1951, Rhokana brought its electrolytic cobalt refinery into production. This will improve recovery and enable a high purity cobalt metal tc be produced.

The United States is the largest consumer of cobalt in the world but to date only a fraction of requirements is produced within the United States. The Pyrites Company, Wilmington, Delaware, recover cobalt from iron pyrites, containing 1.3 percent cobalt, and which has been separated from the magnetite mined at Cornwall, Pennsylvania.

With improved economic and technological conditions two important sources of cobalt are due to become available by 1953:

World Production of Cobalt By Countries in 1950 and Estimated 1951 Production Measured in Short Tons

Country	*1950*[1]	*1951*
Australia	11	10
Belgian Congo	5,675	5,900
Canada	313	802
Morocco, French	430	678
Northern Rhodesia	737	900
United States	329	265
	7,495	8,555

[1] U.S. Bureau of Mines, Minerals Yearbook—1950.

1) The recovery of cobalt from the complex Ni-Cu-Co-Pb-Fe ore from the properties of the St. Louis Smelting and Refining Co., near Fredericktown, Missouri. By means of differential flotation the minerals have been separated into a lead concentrate, a copper concentrate containing lead, and a nickel-cobalt concentrate containing 19 percent nickel and 12 percent cobalt when roasted.

2) The greatest immediate tonnage promises to be from the Blackbird mine of the Calera Mining Company, subsidiary of the Howe Sound Company operating in Lemhi County, Idaho. A production of 3,000,000 pounds per year is contemplated. Mining and milling at the rate of 600-tons daily capacity is in progress and 1,000 tons daily is the objective. The cobalt-copper-gold concentrate is being stockpiled, awaiting completion of the cobalt refining plant at Garfield, Utah. The copper-gold concentrate is shipped, as produced, to the smelters.

The largest source of Canadian cobalt is at present derived from the nickel ores of International Nickel Company and as a by-product from the processing of uranium ores by Eldorado Mining & Refining Company, but the market price of silver and the action by the Canadian government in increasing the price of cobalt for its account will have a stimulating effect on the silver produces in the Cobalt-Gowganda camp, cobalt being a by-product of silver mining in this area. For every 3,000 ounces of silver there is approximately 100 pounds of cobalt.

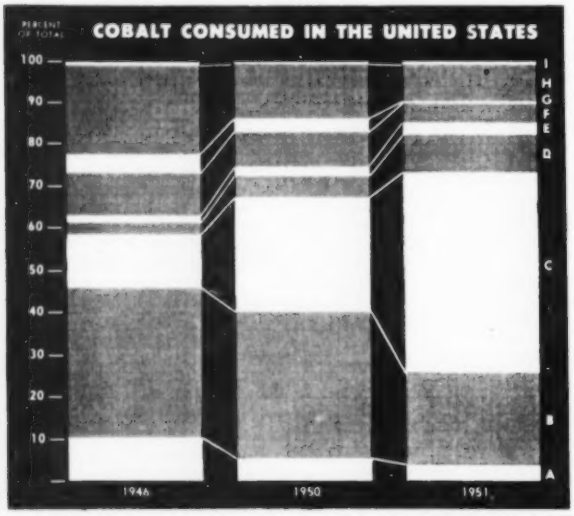
The success of Silver Miller, Siscoe Metals Ltd. and Cobalt Lode Silver has given much impetus to exploration in this historic camp. Diamond drilling and a re-study of the geology may well improve Canada's cobalt position.

The Lynn Lake ore bodies of Sherritt Gordon Mines, Ltd. when brought into production will further add to Canadian production to the extent of an estimated 300,000 pounds per year.

Canadian cobalt production for 1951 excluding cobalt shipped for further processing is estimated at 947,216 pounds, valued at $1,822,600.

Processing of cobalt ores, concentrates and residues on a customs basis or by direct purchase is carried out by the Deloro Smelting & Refining Co. Ltd. at Deloro, Ontario. The Deloro plant, established in 1907, was the sole refiner of cobalt available to the allies in both World Wars and is now in the midst of a $2,000,000 moderization and expansion program. The Deloro plant is unique among the world's smelters and refiners as it is designed to process arsenical cobalt bearing materials. The Moroccan ores and the silver ores and concentrate from Cobalt contain 30 to 50 percent arsenic.

La Société Minière de Bou-Azzer et du Graara, Casablanca is the sole producer in French Morocco. In 1950 some 3,509

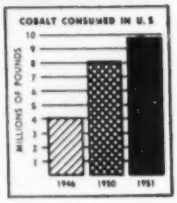


COBALT USES IN THE UNITED STATES

(A) High speed and other steels. (B) Permanent and soft magnetic alloys. (C) Cobalt-chromium-tungsten-molybdenum alloys. (D) Alloy hard facing alloys and cemented carbides. (E) Other metallic uses. (F) Ground coat frit. (G) Pigments. (H) Salts and driers. (I) Other non-metallic uses.

PERCENTAGE USES BY YEARS

YEAR	A	B	C	D	E	F	G	H	I
1946	10.2	36.4	12.8	1.8	0.8	10.0	5.0	22.4	0.6
1950	5.8	35.2	27.0	6.0	1.8	9.0	3.8	13.0	0.4
1951	4.0	21.0	47.8	8.0	3.0	5.2	0.4	10.0	0.6



metric tons, containing 390 tons of cobalt, were produced. During 1951, 2,727 metric tons of ore were shipped to Deloro Smelting and Refining Co. at Deloro, Ontario for processing to metal for the FCA. The ore contains 10 to 12 percent cobalt with small amounts of gold, silver, and nickel.

In 1951, approximately 85 percent of the world production of cobalt was used in the metallurgical industry and the balance in the chemical industry.

In the metal field cobalt is the essential base for permanent magnets, magnetic alloy steels, cutting tools, high temperature alloys for jet-engines and ordnance applications.

Cobalt 60, the radioactive isotope of cobalt, is proving highly valuable in cancer therapy and in radiography for inspecting castings, forgings, welds and assembled metal products. Cobalt 60 practically replaces radium and is available at a fraction of the cost. The development of a cobalt radioactive "bomb" by the National Research Council, Ottawa, is of significant importance in both medical work and nuclear research. The first radioactive cobalt 60 beam therapy unit was installed in the University Hospital, Saskatoon, Canada during 1951. The treatment head of the unit, containing cobalt encased in one ton of lead, emits gamma rays, the amount of which can be closely controlled. The 10 by 10 foot room to house the unit is constructed with concrete walls one foot thick.

It is reported in authoritative quarters that the expansion of production in recent years has compelled Union Minière du Haut Katanga to treat lower grade ores with a consequent increase in production cost. With present conditions a price change will be upward rather than downward.

COPPER

By W. W. LYNCH
Vice President
Calumet & Hecla Consolidated Copper Company
New York, New York

At the outset of 1951 it was generally predicted that the year would be one of scarcity of copper because of defense requirements, and that government controls of price and usage would be instituted. This, indeed, was the case. Some of the weird happenings that have resulted from government controls, however, were not predicted nor even dreamed of by the copper industry. Particularly is this true with respect to developments as to price.

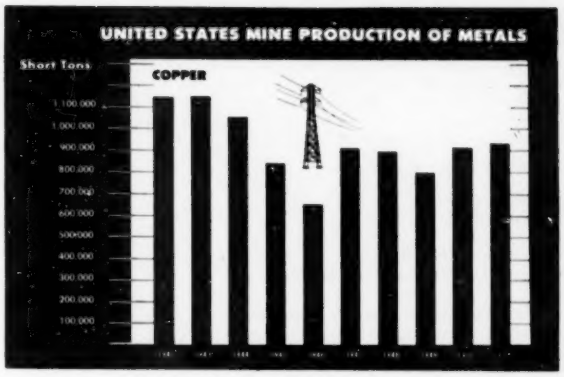
The price of refined copper quoted by all but a few minor producers at the start of 1951 was 24.5 cents per pound, Connecticut Valley basis, and this was recognized as the "official" price at that time. Because of the scarcity of copper toward the latter part of 1950, only restraint on the part of United States producers had kept the domestic price from going higher.

Late in January, 1951, the government established a ceiling price on all materials, except some agricultural products, at the level of prices in effect during the period December 19, 1950 to January 25, 1951. For all except a few minor producers and "traders" the ceiling price of refined copper was thus established at 24.5 cents per pound. At present writing, a year later, the ceiling price for domestic copper continues to be 24.5 cents in spite of increased wages and other increased costs.

Abroad, however, there was an altogether different situation. Even before the beginning of 1951 copper was being sold abroad at 30 cents per pound or higher. As the year 1951 progressed, prices abroad advanced to more than 50 cents per pound, or more than double the domestic ceiling price. Under this circumstance the restraint which United States producers had exhibited toward the end of 1950 and which caused their ceiling price to be 24.5 cents per pound proved to be a trap set by themselves and into which they fell.

At least this seemed to be the view of the Chilean government, perhaps with some justice and at least with good reason from its standpoint since the tax income of Chile depends largely on the price of copper. It irked them to see the United States companies operating in Chile selling copper in the United States at the imposed ceiling price of 24.5 cents when much higher prices could be obtained abroad. It was obvious to them, moreover, that the United States needed their copper badly. With cool logic, therefore, they demanded and obtained, through our State Department, an increase in the ceiling price for Chilean copper to 27.5 cents per pound. The ceiling price of domestic copper was nevertheless kept at 24.5 cents.

Thus there was created the fantastic situation of the Government's saying, in effect, to the domestic consumer that Chilean copper was worth 3 cents a pound more than United States copper. This was also saying to the domestic producers, even the high-cost ones who were struggling for existence, that



they could get along well enough at a price 3 cents lower than the Chileans. From a former condition under which the domestic copper producer was protected by tariff, the picture suddenly changed to one of paying Chile a premium for its copper. Complaints by domestic producers against such discrimination have, up to present writing, been to no avail.

No accurate figure can be given as to what the demand for refined copper was in the United States in 1951. It may be said only that it was far above the available supply of about 1,368,000 tons.

Early in the year restrictions were placed on the use of copper in order that defense needs might be met. Starting in August, 1951, sales of refined copper were permitted only on government allocation. Deliveries to government stockpile against existing contracts were deferred because of the shortage. Instead, some 55,000 tons of copper were reluctantly released from the stockpile to ease the situation. In brief, during the entire year of 1951 there was a desperate shortage of copper.

Defense requirements are currently taking about 30 percent of the total copper supply. According to government reports, this figure may rise in 1952 to 60 percent. Estimates by government agencies envisage a grave shortage of copper for at least several years. The question vital to producers and users of copper, to labor and, in fact, to the country at large from a security standpoint is whether or not the government estimates are correct, and if so what is to be done to meet the situation.

The stated goal of the Defense Production Act of 1950 is to "facilitate the production of goods and services for the national security." The act provides for "financial assistance for expansion of productive capacity and supply." With the passage of this act the copper miner, along miners of other metals, saw hopes of rebuilding their declining industry. Various agencies were set up in Washington to administer the act. Among these were DPA, NPA, DMA, OPS and others.

In October, 1951 the DMPA (Defense Minerals Procurement Agency) was established in an attempt to overcome the previous "red tape" difficulties and to "streamline" the procedure of increasing metal production under the Defense Production Act. Since that time under Administrator Jess Larson and Deputy Administrator Howard I. Young, considerable progress has been made. Several contracts have been issued under which, through government guarantee of price and other assistance, domestic copper production is expected to increase by some 250,000 tons during the next three to five years. Likewise some contracts have been issued providing subsidies to certain copper mines which otherwise would have had to close.

Aside from the previously-mentioned discriminatory aspects, it seems axiomatic that bringing the ceiling price of domestic copper in line with that of Chilean copper, i.e., from 24.5 to 27.5 cents per pound, would reopen numerous small mines in the West, would bring out more scrap and otherwise encourage production. This view has been expressed to DMPA and other agencies by numerous mining men whose advice has been sought by these agencies as to how best copper production could be increased. Undoubtedly many in DMPA would prefer such procedure as against a resort to subsidy. But to date of this writing OPS, perhaps guided by others in Washington who dictate their policy, has flatly said "No". Strangely, OPS raised the ceilings on lead and zinc by 2 cents per pound to encourage production of these metals, but refuses to apply the same reasoning to copper.

It seems probable that for copper the year 1952 will be much like the year 1951, particularly in respect to shortage of the metal. Some increase in domestic production may come from the Greater Butte project and possibly there may be a slight increase in imports from Chile. Unless the OPS permits the ceiling price of domestic copper to rise to a level of its ceiling

on Chilean copper, however, the above-mentioned gains may be offset at least partly by losses in production elsewhere.

The Defense Production Act of 1950, as amended in 1951, will expire June 30, 1952 unless Congress extends it. If the Act is permitted to expire, price and other controls will cease. In such case, what then might happen to copper, price-wise and otherwise, is anybody's guess.

GOLD

By George O. Argall, Jr.
Editor *Mining World* and *World Mining*

The year 1951 was an important and significant year for world gold producers. Total output outside the United States and Alaska was several hundreds of thousands of ounces higher than in 1950 despite the decrease of 147,263 ounces in output by the Union of South Africa—by far the world's largest gold-producing country—and 112,296 in Canada (second largest).

For the United States gold producers, it was a far different story. The steadily increasing costs and the fixed price of gold, a combination of factors unique among major gold-producing countries, further curtailed or shut down many gold mining operations. A large part of the production came from by-product gold mined with other metals. Total United States gold output (including Alaska) was down 18 percent (434,230 ounces). This was the largest decrease in production both percentage- and ounce-wise of any major Free World producer.

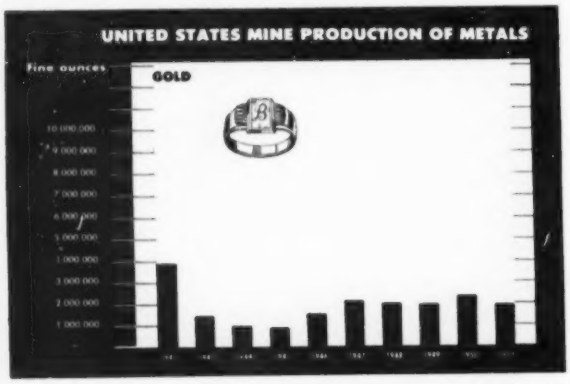
Notable increases in production were made by Australia, Philippines, Peru, Japan, India, Belgian Congo, Chile, and Nicaragua. Output was also up in Brazil, Columbia, Cyprus, and Tanganyika. Decreases were reported from Gold Coast, Southern Rhodesia, (below 500,000 ounces for the first time in 45 years), Fiji, Kenya, and Malaya. A complete report on gold production in these countries is contained in the review of the country in a separate section of this Yearbook.

Premium gold sales had an important effect on raising gold production in many countries. The greatest aid was obtained after the September decision of the International Monetary Fund in permitting its member nations to sell gold for non-monetary purposes at prices higher than $35.00 per ounce. Disposition as to the amount of gold production to be sold at premium prices was left to the individual countries. Several (notably the British colonies) adopted the Union of South Africa's 40 percent figure, but the Canadian and Australian governments imposed no limits. The Canadian government did, however, give producers their choice of premium sales or "gold assistance," not both. The Emergency Gold Mining Assistance Act was extended through 1953.

The Australian government insisted that all premium sales must be made for U. S. dollars and that all gold producers making such sales be members of the Gold Producers Association Ltd. which was incorporated in Victoria with headquarters in Kalgoorlie. The producer continues to sell gold to a Commonwealth Bank, but the Association has the right to purchase gold back from the Bank and to sell it on the free market. All profits are then distributed to the producers in proportion to their production. These returns are exempt from tax, as are the original proceeds of gold sold to the Commonwealth Bank.

A report on the method followed by the Tanganyika Mining Association in establishing premium sales appeared in the February 1952 issue of *Mining World*.

United States gold stocks at the end of 1951 were slightly below those at the close of 1950. As of December 26, 1951, gold stocks were valued at $22,551,000,000, compared with $22,820,000,000 a year earlier. The September 1951 issue of *Mining World* carried an editorial reporting this outflow of gold. In the later part of the year, the trend was reversed, however.



During 1951, gold stocks were increased by England, Belgium, Canada, France, Egypt, Java, Peru, South Africa, Sweden, and the Netherlands. Switzerland stocks, third largest in the Free World, declined.

From a mining and metallurgical standpoint, the outstanding developments were in the Orange Free State where the first two gold mills—St. Helena Gold Mines Ltd., and Welkom Gold Mining Company, Ltd.—commenced operations. First reports of these were in the January and March 1952 issues of *Mining World*. The February and March issues contained reports of byproduct uranium recovery plants at the first four South African gold mines selected. Two additional plants have since been authorized.

The long-range future of gold mining appears dark in view of the world-wide reports of almost total cessation of gold prospecting, or, at best, only limited prospecting and development to discover and bring into production gold mines of the future. Extensions of the gold mining districts in South Africa —particularly in the Orange Free State—were favorable during the year and there is likelihood of at least three additional mines in the future.

For the 1952 outlook, no marked production increase is apparent. In many countries, the increase in 1951 revenue derived from last quarter premium sales has been overtaken by the rising costs of labor and supplies. In some countries, the increased revenue has been more than offset by higher costs. There is no question about the importance of premium sales and the increased revenue was appreciable in some countries. In general, production can be maintained but increased exploration and plant additions will not be possible.

Development to date in the Orange Free State indicates higher grade ore than surface diamond drilling results indicated. An increase in South African output in 1952 is quite probable as the Orange Free State and West Rand mines are placed in operation and stoping of better than average grade ore increases.

Every United States citizen should write his congressmen and demand legislation which would permit him his essential right to own, buy, and sell gold. The United States is known as a free country but citizens of the other countries throughout the world have this freedom of gold which is denied to those in "the land of the free."

FLUORSPAR

By C. O. ANDERSON
Vice President
Ozark-Mahoning Company
Tulsa, Oklahoma

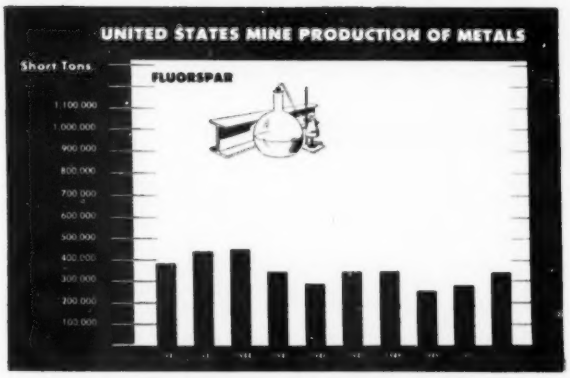
A year ago I reported that during the past four or five years shipments of fluorspar from domestic mines had fallen more and more behind in keeping pace with the increasing consumption. In 1950, the domestic production was 283,200 tons but in 1951 it stepped up to about 344,400 tons, an increase of about 61,000 tons as compared to an increase of 68,000 tons in the overall consumption.

Imports in 1950 soared to the excessively high figure of 164,634 tons, some 53,000 tons more than in any preceding year. It appears now that this high rate was equalled or exceeded slightly in 1951. Of the imports brought in during the first 11 months of 1951, 105,495 tons were classified as containing less than 97 percent CaF_2 and 46,557 tons as containing more than 97 percent CaF_2, the dividing line as to rate of import duty between acid grade and other grades.

The principal countries sending imports of fluorspar to the United States are in decreasing order of tonnage for the first 11 months of 1951, Mexico with 55,111 tons, Germany 44,837 tons, Canada including Newfoundland 21,460 tons, Spain 18,853 tons and Italy 10,086 tons.

The supply situation with respect to acid grade fluorspar in 1951 was more acute than existed with respect to the other grades. The vigorously increasing demands by for example the aluminum industry, the atomic energy program and a variety of fluorine chemicals caused the government agencies to give much attention and effort to relieving the critical situation. Superimposed on the demands by industry was the fact that the Emergency Procurement Service of the General Services Administration sought to purchase substantial quantities for government stockpiling.

In the past fluorspar operations in the western part of the United States have been handicapped very severely by factors such as poor locations as to railroads, remoteness from markets,



high freight rates, smallness of deposits, low gradeness of ores, and the intimate physical association of the fluorspar with silica. An increase of prices of 20 to 30 percent for acid grade concentrates together with the described relaxing of specifications has given a genuine incentive to Western deposits, particularly to date to those in Colorado where, for example, during 1951 Reynolds Mining Company has begun development and some operations near Salida, and Ozark-Mahoning Company has begun intensive mining development and the building of a flotation plant on the deposits formerly held by the Colorado Fluorspar Corporation at Northgate, Colorado. This latter project is tied in with a floor-price contract from the General Services Administration and may be in operation by July 1952. Several other projects have been reported as starting in 1951 or about to take root in other Western states, but the projects mentioned for Colorado together with those already in existence will probably make this state in the next year or two the largest producer of acid grade concentrates in the United States outside of the Illinois-Kentucky District. If domestic production is to increase it must come about in the Western states because the Illinois-Kentucky District is now probably running close to its top speed for the immediate foreseeable future.

IRON ORE

By ROBERT L. BURNS
Field Editor
Mining World and World Mining

In the international loin-girding race that now preoccupies world thinking, the importance of iron ore production, the backbone of industrial and military effort, cannot be overestimated. In 1951 producers throughout the Free World redoubled efforts to develop new plants and properties and increase output from existing deposits. The United States again led the world in iron ore production with all producing areas showing increases, bringing domestic production to an all-time high of 117,000,000 long tons. Shipments from new areas in both South America and Africa began arriving at North American steel mills during the year and existing foreign producers continued to increase production and exports.

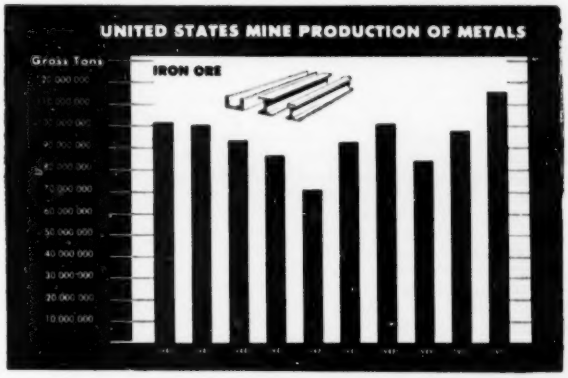
The Lake Superior ranges in the United States (responsible for four-fifths of domestic output) produced and shipped a total of 94,500,000 tons, 25 percent of which was beneficiated material. All-rail shipments, double those of 1950, contained over 8 percent of the total ore moved. The Mesabi's once mighty Hull-Rust pit fell to third place among the major producers with a total of something less than 6,000,000 tons. Oliver's Sherman group assumed leadership with an output of 8,500,000 tons, followed by the Rouchleau group (Oliver) with 6,000,000 tons. Range-wise, Minnesota's Mesabi continued to tower over its nearest rival (Michigan's Marquette) and increased its portion of Lake Superior output to over 75 percent of the total. The Mather mine (Cleveland-Cliffs Iron Company) on the Marquette range remained the district's largest producer of underground ore by hoisting over 1,500,000 tons.

The Southeastern states of Alabama, Georgia, and Virginia increased production to nearly 8,500,000 tons, 12 percent over 1950 figures. New Jersey, New York, and Pennsylvania shipments, 5,000,000 tons, showed a similar increase. The Western states: California, New Mexico, Nevada, Utah, and Wyoming: expanded more than any other area with an increase of 42 percent to nearly 8,400,000 tons, over half of which came from Utah. Export trade to Japan was resumed during the year and accounted for nearly 1,000,000 tons of western output.

The Canadian Lake Superior ranges (Michipicoten and the Steep Rock district) shipped 2,500,000 tons to U.S. ports during 1951, though receipts were more than offset by shipments of nearly 3,500,000 tons from the U.S. to Canada's eastern mills. This trade balance will be reversed sharply, however, when full production is reached in the Steep Rock and Quebec-Laborador regions. It is expected that Canada will be supplying 20,000,000 tons of iron ore to U.S. mills by 1955.

Initial shipments from the two most important potential iron ore producing areas outside North America—Liberia and Venezuela—arrived in the U.S. during 1951 and a combined production of 5,000,000 tons will soon be reached in these two areas. It is predicted that by 1955 they will ship 20,000,000 tons annually to American steel mills.

Taconite mining and processing again highlighted the domestic developments in iron ore production. On the Mesabi range, three of the major producers were bringing large-scale concentration closer to reality by constructing plants and continuing research on milling and mining methods. Activity cen-

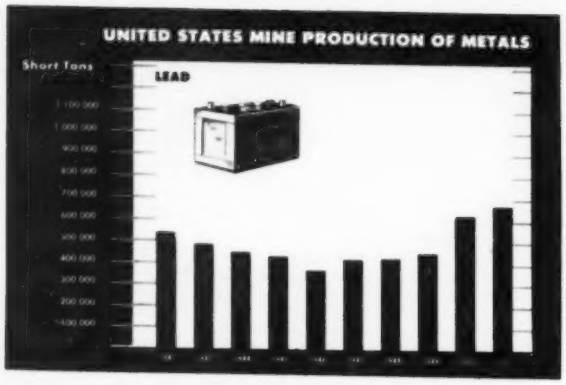


tered in the Eastern district where taconites are amenable to the relatively simple methods of magnetic concentration. The Reserve Mining Company continued with the development of its $75,000,000 program, largest of the present undertakings. Reserve's plans include (1) renovation of the old Mesabi Mining Company mill at Babbitt for pilot plant operation, (2) pit development at Babbitt, (3) Babbitt-Beaver Bay railway construction, and (4) erection of the 2,500,000-ton Beaver Bay plant (to be ultimately enlarged to 10,000,000 tons) and construction of harbor facilities at the plant site.

LEAD

By GEORGE MIXTER
Executive Vice President
United States Smelting, Refining and Mining Company
Boston, Massachusetts

Looking back over the events that affected the lead market in 1951, the decline in domestic production and the very great reduction in imports are undoubtedly the most important. The year opened with a brisk demand which was only slightly limited by the imposition of government restrictions on inventories and was greatly aggravated by the establishment of a ceiling price of 17 cents a pound in January. Since foreign lead was not subject to price control, the price was bid up rapidly in the international markets and imports into the United States fell off rapidly, reaching an estimated total of only 180,000 tons for the year, a decline of nearly 60 percent. The present rate of consumption would normally be satisfied by domestic mine production, secondary lead and imports in approximately equal amounts. The cutting off of the supply of foreign lead, which sought the better prices obtainable in the free markets of the world, and a small reduction in domestic production estimated at about eight percent, though offset in part by an increase of 14 percent in secondary production, caused a severe shortage in this country. It was not until October that the control authorities saw fit to recognize the seriousness of this situation by permitting an increase of 2 cents a pound in the ceiling price for domestic lead which brought it to 19 cents a pound com-



pared to 21½ cents to 22 cents a pound for Mexican lead at Gulf ports.

For a considerable period sales of scrap almost ceased but with the stabilizing of the price of pig lead at 19 cents a pound, it again began to move to the secondary smelters.

Early in the year labor shortages began to develop here and there and, particularly during the summer months, curtailed domestic production appreciably. This difficulty may be greatly accentuated as our armed forces expand and man-shortage should be recognized in Washington as a prime reason why domestic production does not rise adequately in wartime. The solution of this problem is difficult, but it is a problem that must be faced if maximum production is to be attained and maintained. The fostering of exploration projects and the payment of subsidies for production from high cost mines, as done during the last war, were not satisfactory approaches. Financial incentive adequate to arouse interest in and to supply capital for the mining industry must be provided in the form of adequate prices and a favorable tax climate, but no amount of incentive can result in increased production unless men are available to work our mines, particularly those in which production per man hour is high.

Estimated Available Lead Supplies in the United States in Short Tons For 1950 and 1951[1]

Source	*1950[2]*	*1951*
Domestic mine production	430,000	395,000
Domestic secondary production	421,000	480,000
Refined lead imports	442,000	180,000
Production from foreign ores and base bullion	79,000	75,000
From government stockpile		10,000
Estimated decrease in smelters' stock	64,000	5,000
Total	1,436,000	1,145,000

1. Estimates supplied by Lead Industries Association and are based on latest available figures. 2. Actual.

As the year ended, demand for lead in foreign countries was approaching satisfaction and the free market price dropped materially and, at this writing, only exceeds the domestic price by the amount of the tariff. Under these conditions, it can be anticipated that imports will increase and that the acute stage of shortage in this country will be relieved so long as consumption approximates present levels. It is estimated that direct defense requirements did not exceed 15 percent of the available lead supply during the year, but this percentage can be expected to rise rapidly as defense production accelerates. New sources of supply both in this country and abroad will tend to ease the overall situation and the law of supply and demand can be depended upon to maintain the balance between the markets of the world if it is allowed to operate. During 1951 little, if any, lead was purchased for the government stockpile and in fact, at the urgent request of consumers, some tonnage was released by the government for distribution in trade channels. It is reported that about 10,000 tons were actually supplied from this source. It is to be hoped that this amount will soon be replaced and that no precedent has been established for diverting stockpiled metals from their true and proper function—to be a source of emergency supply in wartime.

Estimated Lead Consumption in the United States in Short Tons in 1950 and 1951[1]

Use	*1950[2]*	*1951*
Storage batteries	407,000	380,000
Cable covering	137,000	130,000
Tetraethyl lead	111,000	128,000
Miscellaneous industrial uses	557,000	512,000
	1,212,000	1,150,000
Decrease in consumers' inventories		35,000
Increase in consumers' inventories	25,000	
Total	1,237,000	1,115,000

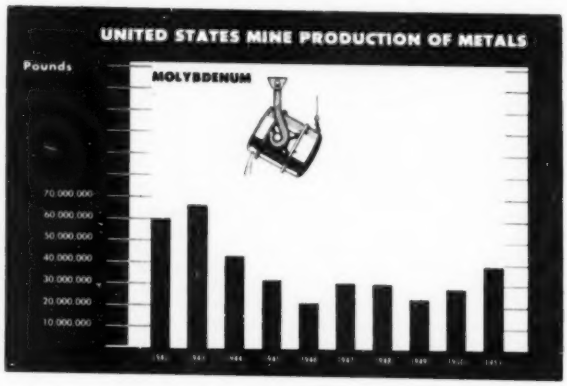
1. Estimates supplied by Lead Industries Association and are based on latest available figures. 2. Actual.

MOLYBDENUM

By C. M. LOEB, JR.
Vice President
Climax Molybdenum Company
New York, New York

The total United States production of molybdenum increased markedly in 1951 over 1950. This increase resulted from greater production at the Climax, Colorado, mine of the Climax Molybdenum Company.

United States production of molybdenum in concentrate, measured in pounds, from 1947 to 1951 has been: 1947, 27,047,000; 1948, 26,706,000; 1949, 22,530,000; 1950, 28,476,600; and 1951, 38,902,400.



The demands of the western nations for molybdenum remained heavy throughout the year. The total quantity of molybdenum available to the western world was placed under the jurisdiction of the International Materials Conference during 1951, which is allocating the available molybdenum among the nations in the conference. The domestic distribution has remained under government control.

Despite the efforts made by the steel and iron industries, and the consuming industries, to use molybdenum with maximum efficiency, it has continued in short supply because molybdenum-containing alloys are in increasing demand for both defense and civilian production.

NICKEL

By DR. JOHN F. THOMPSON
Chairman and President
International Nickel Company of Canada, Limited
Copper Cliff, Ontario

The free world's production of nickel for the year of 1951 was approximate 295,000,000 pounds, an increase of more than 10 percent over 1950. Canadian producers were responsible for 275,000,000 pounds, or more than 90 percent, of the free world's total. In 1950, Canada produced 247,000,000 pounds of nickel in all forms.

Measures to maintain this superiority in nickel supply were taken during the year by established nickel producers as well as new potential producers, in a number of instances with government co-operation. These efforts will assure continuance of the amounts now available and are expected also by 1954 to provide an increase of approximately 30 percent over that available before the Korean conflict.

Falconbridge Nickel Mines Limited, Canada's second largest nickel producer, embarked on an expansion program which its officials have stated was designed to increase maximum production to a rate of 40,000,000 pounds of nickel annually and would require a minimum of three years to complete. Falcon-

bridge's annual output has been approximately 25,000,000 pounds.

Plans of Sherritt Gordon Mines Limited, with deposits in the Lynn Lake area of Northern Manitoba, are said to call for initial production by the end of 1953. Its annual capacity of 17,000,000 pounds of refined nickel is expected to be attained in 1955. The company has entered into a contract with General Services Administration of the United States Government for the delivery of a substantial portion of its anticipated nickel output during the first five years of production. In addition, the Canadian Government is assisting the Canadian National Railways in the construction of a 155-mile rail link to the Lynn Lake nickel-copper-cobalt desposits.

International Nickel Company of Canada, Limited achieved an increase of its nickel production by 12,000,000 pounds annually. INCO is pushing its long-range underground mine development program which, when completed in 1953, will give the company the largest non-ferrous base metal underground mining operation in the world.

Early in 1951, General Services Administration announced it had completed arrangements for reopening the United States Government's Nicaro nickel plant in Cuba. The plant, with an annual capacity of 30,000,000 pounds, was operated from late 1943 to early 1947. Initial production at the reactivated plant is expected some time in 1952.

Announcement was made in October that the Defense Materials Procurement Agency in the United States had reached an agreement with National Lead Company for increased production of nickel in the United States. A new cobalt, nickel and copper separation plant at Fredericktown, Missouri, is slated for operation in the first half of 1953. This is expected to add a total of nearly 9,300,000 pounds of nickel to National Lead Company's production over the next five years.

Increased output is anticipated next year from the nickel mines in New Caledonia. Operated by the French firm S. A. Le Nickel, the mines expect to produce more nickel in 1952 than the estimated production of 13,000,000 to 14,000,000 pounds for 1951. The mines and plants are currently being modernized and further developed.

In addition to the increased production already foreseeable, wide exploration and prospecting for new nickel deposits are in process in Canada, Africa and elsewhere.

OIL SHALE

By BOYD GUTHRIE
Chief
Oil-Shale Demonstration Branch
U. S. Bureau of Mines
Rifle, Colorado

Improvements in our standard of living during the last several decades have closely paralleled increases in the consumption of liquid fuels in the United States. To maintain our high standard of living in future, it is important that continued supplies of oil in astronomical quantities be assured for years to come. To meet any exigency with regard to liquid fuels that might be brought about in case of war, it is imperative that the United States have an adequate supply of oil. Our national requirements for petroleum products have increased tremendously during the last decade, as they did in earlier years.

In 1949, it was demonstrated that oil shale could be mined for about 60 cents a ton. Since then, labor and equipment costs have increased, and it has been necessary to escalate many cost items; but even so, improvement in techniques and equipment has enabled the Bureau to reduce the estimated cost of mining oil shale industrially to 47.63 cents a ton. This includes management, depreciation, and taxes but does not include depletion, interest on investment, profit, or expenditures for off-site facilities.

The scope of the experimental oil-shale mining program was reduced considerably in 1951 and the emphasis was shifted from applied to basic research. An important phase of such research is the study of explosive action. During experimental blasting tests, data were gathered by means of a series of instruments designed to record the intensity and shape of strain waves caused by detonation of an explosive. These instruments also gave a measure of the time required for this strain wave to travel from the point of detonation to the point of measurement. The experiments show that the strain wave consists of a compression impulse that reflects from any free surface, such as a bench face, as a tension wave. There is good evidence that this strain wave actually produces fracturing by being reflected from a surface as a tension wave.

High-speed motion pictures were taken during some of the blasting studies and by analyzing the film, frame by frame, a "timing of events" was made with respect to hole detonation, fracturing, and actual rock movement.

In research on drilling, most of the efforts at the Bureau's oil-shale mine were devoted to rotary drilling. Power for the experimental rotary drilling machine is furnished by a 50-hp. electric motor that operates hydraulic pumps which drive a drill and feed motor. The entire assembly is mounted on a model HD-10 tractor.

Developing a bit with the desired characteristics has been the principal objective of the experimental rotary-drilling program. Early tests showed that the hardest-grade tungsten carbide inserts were the most abrasion-resistant but were subject to failure by compression in the center portion of the bit. Softer grades resisted failure by compression but yielded poor bit life because of low abrasion resistance. A bit combining the abrasion resistance of harder-grade inserts and compression strength of softer-grade inserts was designed by Tool Specialty Company of Los Angeles, California, and is the most successful type of bit tested to date.

Enough operating and bit-testing data have been gathered to show that rotary drilling would be more economical than percussion drilling for the bench level of an oil-shale mine.

Research was continued on percussion drilling as, so far, this appears to be the more practical means of drilling on the upper or heading level, where the holes are parallel to the bedding. A study was made to ascertain how drill-rod failures might be reduced. The problem of drill-rod failures has become of major concern in the mining industry. Primary causes of such failures are improper handling or misuse and improper heat treatment. Failures due to improper handling can be minimized only through adequate supervision and training of employees who use percussion drill rods. Failures due to improper heat treatment usually occur in the so-called "soft zones" of a drill rod—where the forging, normalizing, or hardening heat blends into the "as-rolled" section of the rod. A method for minimizing "soft-zone" failures was suggested by metallurgists of the Crucible Steel Company of America and has been tried with good success. This method involves a heat-treating procedure that produces a more-gradual drop in hardness from heating to nonheating zones of the rod than is attained by ordinary methods.

In a large room developed especially for the purpose, studies of mine structure and stress analysis were made to ascertain the proper size of rooms and pillars for an oil-shale mine. This room, which was originally 50 feet wide and 100 feet long, was widened by 10-foot intervals to 80 feet and last fall was lengthened to 200 feet. Then a large slab about 20 inches thick fell from the roofstone. It was concluded that a factor of safety exists for rooms 60 feet wide but that a room 80 feet wide would not be safe.

PERLITE

By E. P. CHAPMAN, JR. and JOHN A. WOOD
Consulting Geological Engineers
Albuquerque, New Mexico

Despite curtailment in building activity as a result of government regulation, the perlite industry continued its rapid growth during 1951. A net gain of some 35 operating expanding plants was made during the year, about 100 plants being in operation at the year's end. Two new crushing and sizing plants for crude perlite were completed and placed in operation: one at Lovelock, Nevada by United States Gypsum Corporation, the other at No. Agua Mountain, New Mexico by F. E. Schundler & Company.

Dant and Russel, St. Helens, Oregon; Panacalite Division, Combined Metals Reduction Company, Castleton, Nevada; AleXitE Engineering Company, Florence, Colorado and Great Lakes Carbon Corporation, Socorro, New Mexico all furnished sized and graded perlite feed to the expanding furnaces in record quantities. Production of crude perlite during the year was

approximately 200,000 tons from which about 40,000,000 cubic feet of expanded products were produced.

Plaster aggregate market continued to absorb the largest quantity of expanded material, approximately 85 percent of all perlite produced going into this field. Acoustical plaster grades were in far greater demand than available supplies. Use of expanded perlite as a lightweight concrete aggregate increased with emphasis on non load bearing units such as roof decks. Precast perlite concrete slabs, light in weight and having adequate strength became increasingly popular during the year and consumed large volumes of material.

The use of perlite in conjunction with oil well drilling approached standard practice during the year. As a result of intensive research in the laboratories of perlite producers, major oil companies and private consultants, much advancement was made towards determination of optimum particle size gradation and particle density for an expanded perlite best suited to give the desirable properties to drilling muds and cement slurries and yet withstand the extreme pressures encountered in the deep wells so frequently drilled today.

During the spring and summer of 1951 an experimental program was carried out using the unexpanded minus–50-mesh waste product from a perlite crushing and sizing plant as a cement extender in oil well cementing. Used in conjunction with expanded perlite and replacing 50 percent of the normal cement requirements, test results in 50 West Texas wells showed slurry characteristics, fill up, and comparative pumping costs to be very attractive. However, because unexpanded perlite fines tend to pack severely and are very abrasive, they were found difficult to handle in oil well cementing company's bulk stations. The use of perlite fines as a cement extender has been discontinued, at least for the present.

Particle size gradation is as important as particle density, if not more so, in almost every use of expanded perlite. A great deal of the present rapid growth rate of the industry can be credited to: first, determination of proper specifications for each use through research and second, adherence to these specifications by strict plant control.

The Perlite Institute, 35 West 53rd Street, New York 19, New York, continued to work towards standardization of specifications and to encourage research into new uses. Membership, made up of concerns actually engaged in mining, sizing or expanding perlite, increased 25 percent to a total of 45 members during 1951. The perlite industry lost an outstanding leader with the death in December of Wharton Clay, secretary-treasurer of the Institute since its founding. President of the Institute is J. John Brouk, president of the St. Louis Pre-Cast Slab and Tile Company, of St. Louis, Missouri. Kirk E. Hazelton, general manager of the Cleveland Gypsum Company, is vice president. Virginia Gunder is office manager.

Several characteristics in which perlite is unique seem to insure the continued rapid growth of its use in industry. It is chemically inert and hence relatively stable. Density of expanded products may be readily controlled through a wide range by feed size regulation and furnacing technique. Thermal insulation and acoustical properties are outstanding. Since uniform crude perlite of excellent quality is available in very large quantities, and there is a very wide field to which this material's distinctive qualities might be applied, it seems safe to predict a bright future for this infant in the industrial field.

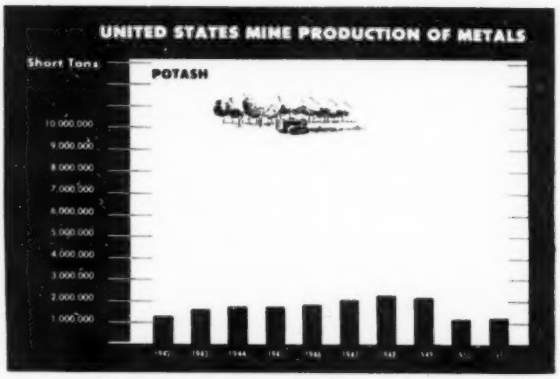
POTASH

Production of potash in the United States during 1951 was the greatest on record. As the year closed a sixth company made its first shipments from the Carlsbad, New Mexico district. This was the Duval Sulphur and Chemical Company which completed its No. 2 shaft; continued work on the No. 1 shaft; produced its first ore; and completed surface construction of the crushing plant, refinery storage facilities, loading and shipping conveyors, and the plant water system during the year.

First production from the new mine and refinery of the Southwest Potash Corporation in the Carlsbad district is scheduled for 1952. Southwest started sinking of two circular shafts. Pre-grouting of the water bearing zone from the shaft bottom and above the zone was carried out successfully. On the surface Southwest completed railroad and power lines to the plant, finished various warehouses and plant auxiliaries.

The three established Carlsbad potash producers made the following mine, and plant additions and improvements during the year:

Potash Company of America increased refinery flotation capacity with a new type of machine, installed a new automatic boiler, built a fifth storage warehouse, improved the potassium chloride warehouse, and installed a new Diesel engine in the power plant. In the mine two new continuous miners were



placed in operation, and sinking of the south shaft continued. This shaft was sunk through a water bearing quicksand zone which had been stabilized by freezing from the surface.

The International Minerals & Chemical Corporation increased ore tonnage and rushed mine development for larger tonnages in the future. The No. 3 shaft was completed during the year and the No. 4 shaft sunk more than 600 feet. Both shafts were completed through the water bearing zone without difficulty as the shaft areas had been pre-grouted through a series of vertical holes drilled from the surface. Haulageways were begun to interconnect the No. 1 (main hoisting) No. 3 and No. 4 shafts. The use of rubber tired "jumbos" speeded drilling.

The United States Potash Company made a number of additions to mining equipment including a new ventilation system, rubber tired drill "jumbos," a new bulldozer and trailer truck to transport it, and installed trolley phone equipment on underground locomotives. The company started sinking a new 1,300 foot deep circular shaft 15-feet in diameter north of its main mine workings. The shaft will be used for ventilation and as a base for future mine development. Additions to the refinery included a new conveyor and slurry pump system for handling tailing, bagging machinery, and a new dust collection system in the packaging plant.

Expansions undertaken and well under way during 1951 will result in marked increase in production during 1952 provided there will be no crippling labor difficulties.

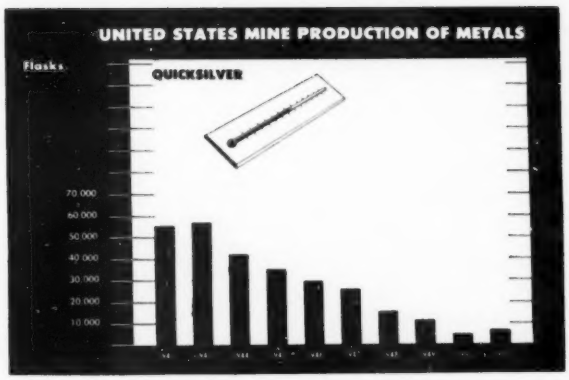
QUICKSILVER

By J. ELDON GILBERT
Manager
Cordero Mining Company
San Francisco, California

Early in 1951 the price of quicksilver climbed to what appeared to be a very high figure. It rose from $70.00 per flask in July of 1950 to $225.00 by January 1951. This drastic change in price should normally affect a similar but slower change in production. However, by the year's end increase in domestic production was not great. In fact, production for 1951, during which the price averaged about $210.00 per flask, was less than double the production of 1950 during which the price averaged $72.00. The reasons for this lack of stimuli by the high price were several:

1. The price of $225.00 per flask is not high in relation to the costs of labor and material. In part of the industry at least, the costs over 1941 were up two and one-half times. This reduces the figure of $225.00 per flask to 90 1941 dollars and at $90.00 per flask in 1941 mine operators were not getting rich. In addition to this, during the year, while costs continued to climb the price sagged to a price of $195.00 during the summer.

2. If there were a policy from Washington encouraging the production of strategic metals it was not apparent in the case of quicksilver. In fact, one of the largest potential producers was saddled with a ceiling price well below the market until August. No market was assured and while the price was up there was no guarantee how long the price would remain. No floor was ever put under the price. It is true that during the year several Defense Minerals Exploration Administration loans were made to aid quicksilver miners but none resulted in finding commercial ore.



3. There continued to hang over the head of the industry the threat of foreign imports. The United States government has taken no steps to regulate or limit them and domestic operators know from experience that when the price is up and the United States' production of quicksilver begins to increase the domestic industry is wiped out by sales of metal from abroad which is imported and sold at almost any price.

At the beginning of 1951 only the Sonoma mine of Sonoma Quicksilver Mines, Inc., Sonoma County, California was in operation. During the year others cautiously moved toward reopening the mines and getting into production. Among these mines were New Idria, San Benito County, California; Bonanza, Oregon; Cordero in Nevada, and several smaller ones.

Production for 1951 was about 7,300 flasks while consumption is listed by the U. S. Bureau of Mines as 39,400 flasks for the first three-quarters of 1951 and is probably 58,000 flasks for the entire year. At the end of the year imports had made up the difference betwen production and consumption.

During 1951 85 percent of domestic consumption was imported. In 1952, unless important new discoveries are made, it is to be expected that at least 75 percent of United States' consumption will have to be imported from abroad.

In 1952 the price of mercury at New York will be set entirely by foreign producers and domestic production will be too small to have appreciable effect. Whether the foreigners will continue to squabble among themselves or form a united front is impossible to predict.

PHOSPHATE

By CHARLES W. SWEETWOOD
Superintendent Gay mine
Simplot Fertilizer Company
Pocatello, Idaho

Word from Washington is that United States Department of Agriculture officials have been surprised at the estimates of super-phosphate production for 1952. Toward the end of 1951, it was estimated that a drop of from 8 to 10 percent would occur in the field. These figures are now being revised upwards.

Washington says the industry may equal last year's production, and adds that this is due to the industry's resourcefulness in securing or reclaiming acid.

During 1951, the super-phosphate market continued to hold tight, and there was considerable inquiry for additional supplies. Because their output was heavily under contract for the season, much of this new business has been turned back by producers.

Meanwhile, substantial increases in the fertilizer industry by 1955 are visualized as needed by Washington in its long-range expansion program. Department of Agriculture specialists are studying expected population, acres under cultivation, export requirements, land capability, farmer habits and other considerations involving the industry.

Since 1946, the Simplot Fertilizer Company has been engaged in an extended exploration program for phosphate deposits throughout southeastern Idaho, in Montana, Wyoming and Utah. The Monsanto Chemical Company recently purchased several of the company's properties located in the Soda Springs-Blackfoot Reservoir area of southeastern Idaho. The chemical company has started its mining operations to supply a new electric furnace plant now under construction near Soda Springs.

The Victor Chemical Company in Montana is presently constructing an electric furnace for elemental phosphorous production. South of Conda, Idaho, the Anaconda Copper Mining Company is carrying out exploration and development of its holdings there. Surface mining operations of the San Francisco Chemical Company are continuing at Montpelier, Idaho, and Leafe, Wyoming. In the Garrison, Montana, area, the Montana Phosphate Products Company continues production from underground mines.

Although in its infancy in the West, the phosphate industry —in both the fertilizer and chemical industries—has an excellent future. The Simplot Fertilizer Company is the West's largest producer, but no doubt future tonnages of this and other companies will far exceed the present yearly production totals. Many believe this region will one day become the phosphate center of the United States.

SILVER

By HON. JOHN T. WOOD
United States Congressman
1st District, Idaho

Idaho continues to lead, by a large margin, in the production of silver in the United States. Of the 1951 total U.S. production of 39,463,661 ounces of silver, Idaho produced 14,642,231 ounces, or approximately 37 percent.

Because of Idaho's silver production—and only because of that silver production—Idaho was able to produce 79 800 tons of zinc and 79 783 tons of lead in 1951—the second largest production of lead and zinc in the nation; for it is the silver content in the lead and zinc ores of the Coeur d'Alene mining district of Idaho that makes possible the profitable operation of the great mines of that area.

It is no mere coincidence that five silver-producing states produce approximately 90 percent of the copper and 50 percent of the lead and zinc within the continental U.S. For while silver is only a byproduct in the lead, copper, and zinc mines of these states, the silver content of their ores and the price of silver are always important factors—often the controlling factor —in the profitable operation of their mines.

It is ironical that with 70 percent of our metal mines closed because of unsound, unrealistic legislation, we are importing huge quantities of lead, copper, and zinc at prices above those which domestic mines are permitted to charge. Not only are we paying above the domestic price for these imported metals, but we are, in effect, subsidizing them 60 percent by paying for them in gold at $35.00 per ounce when, based on the present value of the dollar, gold is worth not less than $56.00 per ounce.

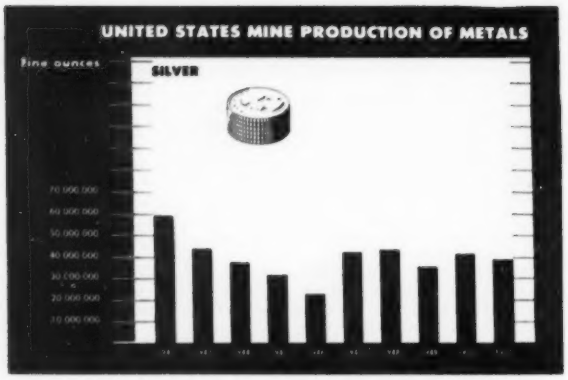
That is the way to national bankruptcy; and the situation is the more tragic because it could be so readily corrected. Our idle mines could be put into profitable operation employing thousands of men at good wages without subsidies or cost to the American taxpayers. Our recoverable mineral resources could be doubled without further depletion of mines; and we could usher in an era of the greatest prosperity, peace, and economic stability America has ever known by putting into operation legislation that has been on our statute books for more than 50 years. *Silver is the magic metal that can make all this possible.*

It becomes increasingly evident that there can never be peace nor economic security here or elsewhere until we adopt a sound monetary system which will maintain and protect the solvency and integrity of the people's money. The reason should be apparent to everyone.

For *money is the measure of the value of all goods and services*—the measure of value of the wages paid the workman for his labor, and the measure of the value of the products of farm, mine, and factory. Unless that measure is honest, constant, and invariable, millions of people will be cheated in the sale of their goods and services while others will profit unjustly. Of such injustices are wars and depressions made.

Money is sound, honest, and dependable only when backed by and redeemable in something of a universally recognized and accepted value; and since the dawn of civilization, the only material things that have ever been universally recognized and accepted in exchange for goods and services are gold and/or silver or currencies redeemable in gold and/or silver.

The panics and depressions of 1873, 1893, 1907, 1920, and



1929, and the abandonment of the redeemability of currency in 1934 prove conclusively that there is not enough gold in the entire world to adequately back currencies in circulation and insure their redemption at face value, on demand.

The best evidence that a return to the single gold standard does not offer a solution to our problems lies in the fact that we were on the single gold standard until 1934 and it neither prevented the 1929 depression nor provided a remedy.

It is quite generally recognized that we are living in the bloodiest century of all history. Since the demonetization of silver in 1873, the world has been afflicted with more major depressions and major wars than ever before known. The causes should be apparent to everyone.

For every war is, in essence, an economic war; and the underlying causes of wars and depressions, booms and busts, inflation and deflation, are unsound monetary and fiscal policies of governments.

These causes can be eliminated in 90 days without cost to the American taxpayers, without economic disturbances of any kind, and without sacrificing the lives of our sons in foreign wars, merely by carrying out the legislative directive in Section 311, U.S. Code Annotated, (Ch. 8, 28 Stat. 4).

This legislation provides for the joining of silver with gold, at fixed and proper ratio, in a return to bimetallism—the most perfect monetary system the world has ever known.

It was with this kind of money that our Republic operated the first 80 years of our national existence, expanding from 13 small colonies along the Atlantic seaboard to a mighty nation. Yes, we did pretty well with that kind of money.

Having pillaged the rest of the world, the absolutists have turned their efforts to pillaging America, and have made an unholy alliance with the Communists and One-World internationalists to achieve their objectives. So long as we protected our home market with a tariff and followed the advice of George Washington to stay out of foreign entanglements, the internationalist conspirators were unable to hurt us.

But the conspirators knew that if they could drain away enough of our wealth so that we could not longer consume the major portion of our own production, our manufacturers would have to seek foreign markets, wages and the price of raw materials would then become mere items of cost to be kept as low as possible; and they would no longer be interested in a protective tariff. Foreign goods from slave labor countries would flow into free trade America to pay interest on foreign bonds.

This would cause widespread unemployment in the United States; and force down the wages of American workmen. Then American industry could be picked up at a fraction of its real value and become a profitable investment for the international bankers.

You will recall that the first act of the Marxists who were surreptitiously infiltrated into key positions in our government in 1933, was to depreciate the dollar and deny to the American people the right of redemption because these conspirators had learned from Karl Marx that the surest way to overturn the social order was to debauch the currency. To accomplish this they installed the Laski-Keynes-Marxist monetary system of a so-called "managed currency."

The fibre, character, and stability of a people's government reposes in the great, thrifty, industrious, patriotic middle class. They were the backbone of this Republic; and would have to be destroyed or reduced to impotency if the conspirators against our freedom were to succeed. What better way to accomplish this than to depreciate the currency and burden them with back-breaking taxes. So faithfully have the conspirators carried out the teachings of their patron saint, Karl Marx, that the dollar and all fixed-dollar-value securities including savings, pensions, and life insurance have lost 63 percent of their value since 1933; and we are burdened with the greatest national debt in all world history.

Prices, taxes, and living costs are high because dollars are cheap. This already has brought financial ruin to many of our most responsible and patriotic middle-class citizens, particularly those who had reached the age of retirement and had their life savings invested in fixed-dollar-value securities; but none can escape the debacle that is coming unless positive, intelligent action is taken in this year 1952.

Isn't it about time for the American people to realize that the United States Government can give nothing to them or foreign nations that it does not first take away from the American people?

And when the real "squeeze" comes, labor will suffer most of all. Of all the devices to rob the laboring man there is none so destructive as irredeemable paper currency.

In the re-establishment of a sound monetary system, the price of gold should be fixed where it accurately and realistically reflects the present depreciated value of the dollar. This could not be less than $56.00 per ounce; and once established, the price should be pegged for a period of not less than 10 years; and changed only after that if justified in full and open hearings before appropriate Committees of the Congress. The price of silver should be fixed to reflect the relative world production of these two precious metals which is at a ratio of approximately 15 to 1; and once fixed, should be pegged along with gold. This would make gold and silver interchangeable at fixed and proper ratio; and eliminate any possibility of the operation of the so-called Gresham law.

These increases (adjustments) in the price of gold and silver would cost us nothing, since gold and silver coins would go into circulation as money, and would be universally recognized and accepted at face value.

The stimulating effect on mining would be instantly apparent. This would be the greatest conservation measure ever enacted, for it would make possible the profitable mining of much marginal ore now being abandoned in the mines or left on the dumps. It would also bring about the profitable operation of most of the 70 percent of our mines that are idle now. Naturally it would also increase the wealth and purchasing power of our silver-producing neighbors in Canada, Mexico, and Central and South America; but just what is wrong with that? It would also bring out of hiding the billions of dollars in gold and silver hoarded throughout the world and stabilize the economy of nations where only chaos and confusion now reign. It would also strip the subversives of the tools with which they work; and stop the pillaging of the people, by the international racketeers, who can perform only in an economy where they can manipulate up and down the "measure of the value of all goods and services."

A sound, honest, dependable monetary system will do more to prevent war, establish justice, insure domestic tranquillity, and promote peace and harmony among nations than all the United Nations, Atlantic Pacts, Marshall Plans, or Point 4 Programs, ever devised.

But remember this: until we adopt a sound monetary system, all the present frenzied efforts to achieve peace and security are just so much sound and fury signifying nothing; for unless money is sound, nothing is sound.

In view of the vital part silver can play in the rehabilitation of the world if we but have the sense to use it for the purpose intended by a Divine Providence, I am sure you will agree with me that SILVER IS THE MAGIC METAL.

SULPHUR

By J. C. CARRINGTON
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Freeport Sulphur Company
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Production by the United States sulphur industry reached record levels in 1951, and numerous projects were begun both in this country and abroad in an endeavor to bring to an end the world shortage of this basic raw material.

Preliminary estimates indicate that 6,200,000 long tons of sulphur from all sources was produced during the year, or approximately 200,000 tons more than in 1950. Of this, it is estimated that 5,525,000 long tons was elemental sulphur, or brimstone, 400,000 tons was sulphur contained in pyrite, and 275,000 tons was sulphur obtained in other forms from smelter gases and other sources. Of the brimstone, 5,325,000 long tons came from the salt dome deposits in Texas and Louisiana and the remainder was recovered from refinery and sour natural gases.

The long range outlook for sulphur was brightened considerably during the past year. More than 50 projects to increase the supply were in various stages of development in the United States and 18 other countries. According to trade sources and published reports, these projects can add as much as 3,000,000

long tons per year of sulphur in one form or another to the over-all world supply in the next two years.

This country alone will contribute by far the lion's share of the new production and most of this will come from new Frasch process mines of the Gulf Coast. Texas Gulf Sulphur Company is opening a new mine at Spindletop, near Beaumont, Texas, which is scheduled to begin producing by the middle of the year. The same company is expanding its production at Moss Bluff. Jefferson Lake Sulphur Company is already producing sulphur from its Starks dome mine in Louisiana.

Two other mines are being developed by Freeport Sulphur Company. One, at Garden Island Bay dome, is being built in the swamplands near the mouth of the Mississippi River and is scheduled for completion in 1953. The second mine is at Bay Ste. Elaine dome where the terrain is partly shallow water and partly broken marshland. It was necessary to build the plant on a giant barge, the first ever attempted in the sulphur industry.

Numerous other countries have projects under way which will add considerably to the supply of sulphur. In Mexico, for example, a 200,000-ton-a-year brimstone mine on the Isthmus of Tehuantepec is reported to be under construction and another mine of similar capacity is being considered.

Industry in Canada is spending millions of dollars in an effort to increase that country's sulphur production. At least half a dozen projects aimed at recovering sulphur in some form from sour natural gas, pyrite and smelter gases are under way. Canada uses large amounts of sulphur, mainly for pulp and paper mills, with the U.S. supplying more than half of her total requirements.

Other countries which have been increasingly dependent upon the United States for their sulphur supplies are stepping up their domestic output. Great Britain is boosting her production from refinery gases and sulphate minerals and also is reported to be increasing production of sulphur from her pyrite mines in Spain. Italy, Sicily, Chile, Norway and Japan all have new developments in progress.

Although the immediate outlook for sulphur during the next few months is still one of shortage, the prospects for a solution have improved greatly with developments in the last 12 months.

TIN

By ROBERT J. NEKERVIS
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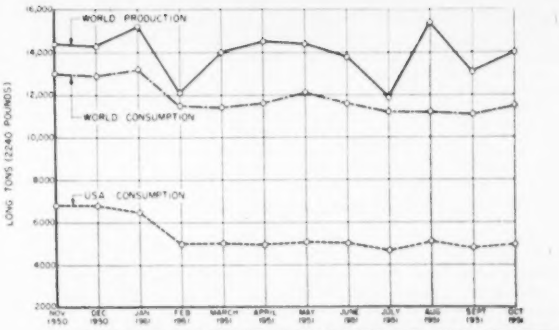
Tin Research Institute Inc.
Columbus, Ohio

The world tin industry is attaining maximum production under present conditions. This is borne out in the International Tin Study Group's comprehensive 1950-1951 Review of the world tin mining industry[1]. Production continues to outdistance consumption as the accompanying chart indicates. (Since no tin is mined in the United States, only U.S. consumption of primary tin is shown in the accompanying chart).

The market situation was the most newsworthy aspect of the tin position in 1951. Owing to anxieties over the future of world supplies since the beginning of hostilities in Korea in mid 1950, the price continued to rise in the free markets for tin, reaching a high of $1.93 per pound on the Singapore exchange on February 14, 1951. The major cause of the drastic price increase was U.S. government buying for the strategic stockpile in the free markets for tin. On March 7, the U.S. General Service Administration suspended all new purchases for the U.S. strategic stockpile, following the recommendations of the U.S. Senate Armed Services Committee report, released the day before. Private importation of tin was stopped on March 12, and the Reconstruction Finance Corporation again assumed the procurement and disposition of tin in the U.S.A. United States government policy changed from stockpiling at high rate to getting prices back to what was considered a reasonable level. Accordingly, the Reconstruction Finance Corporation purchased no tin metal in 1951 after March 8. Purchases of concentrates for the Texas City, Texas smelter from Bolivia, Indonesia, and the Belgian Congo were continued only under existing contracts.

The figures show that world mine output is about what it was during the five year period, 1935-1939, which preceded World War II. Under conditions prevailing in many of these areas, it seems remarkable that production could reach this level.

In Malaya, the continued state of emergency not only imposed great strain on the mining staff and mining labor, but



WORLD PRODUCTION AND CONSUMPTION OF TIN COMPARED WITH USA CONSUMPTION
(FISCAL YEAR NOVEMBER, 1950—OCTOBER, 1951 INCLUSIVE)

also has made prospecting of new ground impossible. Other factors, apart from the problem of Communist bandits, which operated against any sharp production increase, were a major breakdown in the government power station at Kuala Lumpur late in 1950, and the fact that the Malaya collieries were unable to supply enough coal to the tin industry. Roughly, half the Malayan output comes from dredges. There were 80 at the beginning of 1951. Gravel pump mines accounted for another third of Malayan output. There were some 560 of them at the beginning of 1951. All Malayan concentrates are smelted at the Penang and Singapore smelters in Malaya. These smelters also handle nearly all the concentrates from Burma and 2/3rds of the Thailand output. Other major producers in southeast Asia are Indonesia, Thailand, Burma, and China.

Indonesian production comes from three islands, Banka, Billiton, and Singkep, just off the coast of Sumatra. These deposits are a continuation of those of the Malay Peninsula. Production is slightly above the pre-war level. Two-thirds of the output comes from dredging, and slightly under 1/3rd from gravel pumping and hydraulicking. The RFC purchases approximately 1/3rd of Indonesian concentrates for the Texas City smelter annually. The other 2/3rds is smelted in the Netherlands.

Conditions in Burma are unsettled and are reflected in the production figures which are 1/3rd that of the pre-war period, 1935-1939. In Thailand, the rehabilitation of the tin mining industry has been slower that that of Malaya and Indonesia. Present production is about 75 percent of the pre-war figure. At the beginning of 1951, there were 31 dredges and 44 gravel-pumping and hydraulicking mines in operation. The RFC purchases 1/3rd of the Thailand concentrates, about 3,000 tons per year.

Bolivia, the only major producer in the western hemisphere, is a high cost producer. Costs are probably upwards of three times the average Malayan dredging company's and probably ¼ more than the smaller Malayan producer's. The increased production in 1951 may have been stimulated not only by record prices during the first half of 1951, but also by a change in financial regulations in October, 1950, which benefited the mining companies.

As usual, during 1951 concentrates from the Patino Mines and Enterprises Consolidated, the largest producer, were shipped to the United Kingdom for smelting. In previous years, concentrates of the other Bolivian companies have been shipped to the Texas City smelter under a long term contract with the RFC. This contract expired at the end of 1950. Negotiations on another long-term contract have been continued ever since. There is difference in opinion as to what constitutes a fair price. Shipments under interim contracts through May, 1951, were made. Except for the purchase of 4,280 tons of ore under a 30 day contract announced on September 5, 1951, no Bolivian ores were purchased after May, 1951. Bolivia has one small smelter which produced an estimated 64 tons during the period January-October, 1951 inclusive.

Aside from the Far East and Bolivia, the only sizeable producers of tin are the Belgian Congo and Nigeria. Both these countries' intensive productive efforts during the war have depleted the easily exploitable alluvial deposits. The most important producer in the Congo, GEOMINES has started new installations to mine the underlying nondecomposed pegmatites, using a credit from the ECA of $1,700,000. These funds will be repaid in tin to the U.S. strategic stockpile. It is expected that the plant will be in operation by the second half of 1952.

Production in Nigeria is gradually decreasing owing to exhaustion of the higher grade ground. The grade of ground

[1] Tin, 1950-1951, obtainable from the International Tin Study Group, 7 Carel van Bylandtlaan, The Hague, Netherlands.

Production of Tin in Concentrates in Long Tons From Main Producing Countries

Country	Fiscal Year Nov. 50-Oct. 51 Inc.	1950
Malaya	56,758	57,537
Bolivia	34,137	31,213
Indonesia	30,799	32,102
Belgium Congo	13,127	14,558
Thailand (Estimated)	9,750	10,364
Nigeria	8,444	8,258
China (Estimated)	3,600	3,600
Burma (Estimated)	1,680	1,680
U.K. (Estimated)	955	960
Other Countries	7,100	7,600
Total	166,350	167,872

worked in 1939 was 2.26 lbs of cassiterite (SnO_2) per cubic yard as compared with 0.88 lb per yard in 1950. Some companies have undertaken exploration drilling and have driven prospect adits to find out whether reserves of good grade tin lie in deposits under the surface basalt flows of the Nigerian Plateau.

All Nigerian concentrates are smelted in the United Kingdom. About 25 percent of the Belgian Congo concentrates are treated by the local smelter, about 10 percent is exported to the United States, and the balance goes to the Belgian smelter at Hoboken, Belgium. As was the case with Indonesia, the Belgian Congo contract with the U.S. Reconstruction Finance Corporation expired December 31, 1951. It contains an option to renew for the calendar year 1952.

TITANIUM

By P. W. ALLEN
Plant Manager
MacIntyre Development
National Lead Company
Tahawus, New York

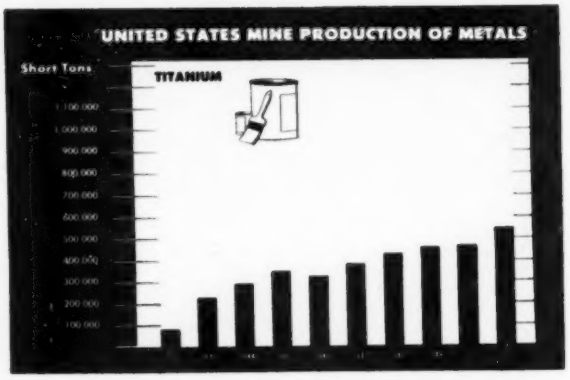
Further expansion of the titanium pigment industry in 1951 called for still greater production of ilmenite which reached a record total of about 483,000 gross tons. An additional 164,000 gross tons of ilmenite were received from Indian sources. Other foreign countries supplied minor quantities. The total ilmenite available in the United States was, therefore, about 650,000 gross tons, but pigment plant demands were such that stockpiles of ilmenite had to be depleted to some extent.

The MacIntyre Development of the National Lead Company at Tahawus, New York remained the largest domestic producer of ilmenite with a record output of 270,000 gross tons. It produced, in addition, more than half a million tons of magnetite concentrates which was converted to sinter and sold to the iron and steel industry.

The duPont Company's plant at Starke, Florida swung into full scale operation according to published information. Approximately 30 000 tons per day of ancient beach sands containing less than 2.0 percent of titanium minerals are being dredged daily from the Trail Ridge deposit. An output of 120,000 gross tons of titanium mineral concentrates is understood to have been made in 1951, the average TiO_2 content being about 65 percent. Important quantities of byproduct zircon are also available from the Trail Ridge deposit. All operations are conducted for the duPont Company at Starke by the Humphreys Gold Corporation.

The beach sand deposits of the Rutile Mining Company at Jacksonville, Florida are also operated by the Humphreys Gold Corporation. The production of ilmenite, rutile, zircon and monazite increased somewhat over that of 1950. Ilmenite was also produced by the American Cyanamid Company at Piney River, Virginia, and the Glidden Company in North Carolina.

Considerable publicity heralded the first full year of productive operation by the Quebec Iron and Titanium Company (a subsidiary of the New Jersey Zinc Company and the Kennecott Copper Corporation). In 1950, 90,000 gross tons of ore were mined from the deposits near Allard Lake (25 miles north of Havre St. Pierre, Quebec) and shipped to the smelter at Sorel. During the shipping season of 1951, mining attained a rate of 1,500 gross tons per day. One electric furnace, with a daily capacity of 300 net tons of ore, worked throughout the year at Sorel; a second furnace was nearing completion late in the year. A total of five furnaces, each with a 300 net ton daily capacity, is expected to be producing by late 1952. Each unit will yield 100 net tons of pig iron and 140 net tons of 70 percent TiO_2 slag per day. Initial shipments of the slag to the pigment industry have been made.



Norwegian production of ilmenite increased somewhat over 1950 levels, practically all of which was used by European pigment plants. The Otanmaki Company, owned largely by the Finnish Government, is equipping an operation to produce ilmenite and magnetite from a daily feed of 1,000 tons of ore that will be mined about 500 miles north of Helsinki.

As noted before, pigment industry requirements of ilmenite were increased to new levels by the expansion of pigment production facilities. Shortages of sulphur, an important raw material in making titanium pigment, forced careful scrutiny of operating procedures and the use of substantial amounts of Indian ilmenite, its TiO_2 content averaging 59 percent in contrast to the 45 percent TiO_2 assay of most ilmenites derived from hard rock operations. Florida ilmenites contain more than 60 percent TiO_2. Higher price and shipping costs raised the delivered cost of the Indian ore.

Recently released 1950 figures show that all but one percent of the ilmenite used is consumed by the titanium pigment industry. The production of ferro-titanium alloys absorbed most of the balance. Titanium oxides find widespread use as pigments in protective coatings for military, industrial and domestic requirements. Welding rod coatings, paper manufacture, rubber goods, plastics and linoleum require important quantities of the oxide.

The year 1951 witnessed great intensification of efforts to improve production methods and output of titanium metal. The Titanium Metals Corporation (a National Lead-Allegheny Ludlum Steel subsidiary) began construction of a 10 ton a day metal plant at Henderson, Nevada. Other firms either entered the field on an experimental basis or expanded existing production facilities. Data recently released by the U.S. Bureau of Mines indicate that 700 tons of titanium sponge were produced in 1951. Rolled titanium shapes were quoted at prices ranging up to $15.00 per pound; reduction of the price to a practical and attractive economic level is the object of every research program. As far as public knowledge goes, nearly all titanium metal is presently produced by reduction of the chloride with molten magnesium or by some variation of that technique.

Rutile is at present an important raw material for the commercial production of titanium metal because of its low iron content. The mineral is produced in important quantities from some Florida beach sand deposits and from sands in Australia. Known rutile reserves, however, are very limited in comparison with those of ilmenite; intensive search is being made. Australian imports in 1950 were published as 3,400 net tons.

TUNGSTEN

By JAMES P. BRADLEY
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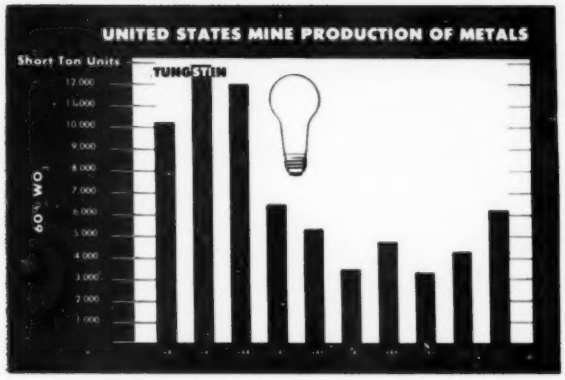
On the basis of U. S. Bureau of Mines reports for the first three quarters of 1951, domestic mine production of tungsten can be estimated at about 360,000 short ton units WO_3 for the year. This compares with a domestic output of 254,600 units in 1950 and with 723,316 units in 1943 (peak year for domestic protion).

During the first nine months of 1951, the total United States tungsten supply (imports plus domestic production) was not sufficient to meet all requirements. Toward



the end of the year the supply-demand situation was about in balance—this caused, no doubt, by the curtailment of the armor piercing projectile program. Whether or not tungsten will be in short supply in 1952 is dependent upon a number of uncertainties, such as the availability of foreign supplies, stockpiling by the United States or other governments and the quantities of tungsten required for atomic energy purposes, armor piercing projectiles, high temperature alloys for jet engines and other military uses.

Increased activity in tungsten mining and exploration during 1951 was noted in many of the western states and the Hamme mine in North Carolina is expected to have its expanded milling plant in operation in 1952.

Following the General Ceiling Price Regulation (or "price freeze") of January 26, 1951, there was much confusion and uncertainty over tungsten prices until the overall ceiling price for tungsten ores and concentrates was established in April (CPR 19) at $65.00 per short ton unit, f.o.b. shipping point. The OPS tried to push the ceiling down to $45.00 per unit, but strong representation by the DMA prevented this action.

Since February, 1951, deliveries of tungsten ores and concentrates have been subject to government allocation.

The international allocation of the free world's tungsten supplies was handled by the International Materials Conference with quotas being established for the third and fourth quarters of 1951. The IMC also made price agreements for the third quarter, but not for the fourth quarter.

A floor price program (for domestically produced concentrates conforming to government specifications) was inaugurated in 1951 by the GSA. Under the terms of this program, as amended, the government agreed to buy up to 3,000,000 units, at a price of $63.00 per unit, during the five-year period ending July 1, 1956.

Many tungsten exploration projects were started during 1951 under the DMA exploration program (tungsten is among the group of metals subject to 75 percent participation by the government) and several of these projects have already resulted in ore discoveries.

During 1951, the government went into the foreign market in a big way—by purchasing foreign tungsten ores for resale to industry and by making long-term stockpiling agreements with producers in Bolivia, Canada, etc.

It is believed that some consideration is being given by the DMPA to the establishment of a tungsten treatment plant in the mountain states area. If this would provide a satisfactory market for off grade and low grade concentrates, it would be an important step in stimulating a higher domestic mine output.

VANADIUM

By BLAIR BURWELL
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In common with all tool making alloy metals, consumption and production of vanadium in 1951 increased sharply over 1950. The figures of production of vanadium ore are not available due to the fact that the principal United States vanadium supply continues to come as a by-product of the production of uranium from carnotite ores of the Colorado Plateau. The greatly increased rate of mining in the Colorado Plateau in 1951 indicates again that the United States has continued its world lead in the production of vanadium ore.

Imports of vanadium were sharply down in 1951 in comparison with 1950. Eleven months' imports of 935,000 pounds of vanadium in concentrates compared with 1,700,000 pounds of vanadium in 1950 indicate an increased consumption of domestic metal. Imports of petroleum residues (flue ash) ceased in 1951, as this material was directed to foreign markets.

No official figures are available on ferro-vanadium production in 1951 due to the fact that only two companies produce this alloy at this time—the Union Carbide & Carbon Corporation and the Vanadium Corporation of America. Production and consumption of ferro-vanadium is estimated at 3,500,000 pounds of vanadium metal in 1951. Prices of the metal in ferro varied from $3.10 to $3.25 per pound of vanadium contained depending on grade.

The majority of uses of vanadium (approximately 90 percent) are in tungsten and molybdenum types of tool steel where vanadium is used in quantities varying from one percent in the tungsten steel to two percent in the molybdenum type of tool steel. The increasing substitution of molybdenum has increased vanadium consumption to some extent.

Vanadium is also used as a ceramic color, in inks, and as a catalytic agent in sulphuric acid manufacture, but these uses represent less than ten percent of total consumption. A small amount of vanadic oxide is used directly to make tool steel. The uses of vanadium continue to be restricted to tool steel and high strength structural steels and wear resisting cast iron where substitution of cheaper alloys cannot be made. Attempts to market vanadium in a cheaper form to increase its use in rimming steel in 1950 were apparently suspended in 1951. The increasing amount of vanadium being produced as a by-product of other metals indicate the need of expanded markets at lower prices in the future.

ZINC

By OTTO HERRES
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Combined Metals Reduction Company
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In 1951 the zinc industry of the United States was confronted with such problems as government price control, rationing of its products, another round of wage increases and further tariff reductions by the State Department in the Torquay Agreement. Domestic production and imports of foreign metal and concentrates were restricted by ceilings on prices. Washington was involved in every move of the industry in production, wages, prices and sales.

War and preparations for war demanded great quantities of zinc for various instruments of defense and destruction. In consequence a world-wide shortage of zinc developed and now is in its second year. Under pressure of the emergency the United States Congress expanded the authority of the government to regulate zinc and other industries by means of allocations, price ceilings, taxation, limitations and similar devices of regimentation and control. If defense demands continue to increase as predicted by the Washington planners the shortages of zinc probably will continue into 1953.

But despite limitations imposed by government regulations and controls domestic mine production increased from 623,375 tons in 1950 to 679,111 in 1951. Indications are that production will continue to increase and may reach a total of some 730,000 tons in 1952 provided that output is not restricted by too much participation by Washington in industry affairs.

Shoratges of zinc for civilian use during the year 1951 may be attributed largely to lack of vision on the part of the government planners in refusing to take metal for the defense stockpile during 1949 and early 1950. At that time mines were forced to curtail production and many small producers were shut down entirely because the price of zinc was too low to cover the cost of operation. Early in 1950 the price of zinc was 9¾ cents, at year's end the controlled price was doubled that at 19⅝ cents and consuming industries are rationed or being forced out of business because of limitations on its use.

The most important source of zinc from the viewpoint of national security is production from domestic mines. Obviously additional production can come only from new properties or marginal ore made commercial by higher prices.

The problem of meeting increased demands for zinc for military requirements, the strategic stockpile and essential civilian needs reached a crisis in November, 1950. Defense officials in Washington wrote mine operators pointing out the

gravity of the critical shortage of zinc metal and stated the urgency of expanding domestic mine production could not be over-emphasized.

Several months earlier Congress in the Defense Production Act of 1950 offered specific aids to the mining industry to expand its production of essential minerals and metals. Federal assistance became available in the following forms: 1) Accelerated amortization to provide tax relief for new and expanded production; 2) Procurement contracts with a floor price and time period to be determined by negotiation; 3) Loans, provided private financing is not otherwise available on reasonable terms; 4) Matching funds for exploration work.

The Defense Production Act of 1951 continued governmental authority to make defense loans and long term purchase contracts and broadened somewhat the powers to provide for subsidy payments on metals from high-cost sources.

Regardless of Congressional action and the urgent call that went out from Washington for expanded production of zinc, mining companies responding to the appeal waited many months for certification of projects qualified for accelerated tax amortization. In several instances proposals submitted early last summer, important to zinc production for the defense program, were delayed awaiting approval until January, 1952.

Because two world wars, heavy industrial requirements, population growth and world rearmament have drawn heavily on developed zinc ore bodies, new production must come to a large extent from deeper deposits, complex ores and lower grade material. Extensive mine development and costly treatment plants are required. Capital investment under such conditions cannot be justified without assurance of market stability.

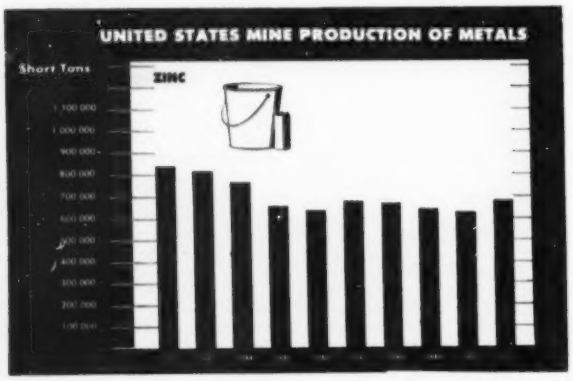
Defense Materials Procurement Agency has reported four agreements to buy zinc—two from foreign and two from domestic mines. Included are 300 tons a month at 17-½ cents per pound from American Zinc Company of Tennessee from its new Jefferson County property and 5,500 tons per year at 17 cents for two years from American Zinc, Lead and Smelting Company of St. Louis to be produced by Quick Seven Mines near Neck City, Missouri, a joint operation with Brown & Root, Inc., of Houston, Texas. The agreements covering foreign production are with Volcan Mines Company of Lima, Peru, for 380 tons a month over a period of three years at 17-½ cents per pound and National Zinc Company for 600 tons a month to be produced at Bartlesville, Oklahoma, from ore mined near Monterrey, Mexico.

Loans when private financing is not otherwise available on reasonable terms have been of small assistance to increase the supply of zinc. Thus far two loans have been reported, one of $400,000 to the Appalachian Mining and Smelting Company at Embreeville, Tennessee, and another of $45,000 to the MacArthur Mining Company for expansion of mining facilities near Baxter Springs, Kansas, including an agreement that the government would buy up to 1,500 tons of slab zinc at 17-½ cents per pound if the company cannot sell it on the market.

It is estimated that zinc from sources shown in accompanying table and available to the United States will amount to an additional 110,000 short tons a year. The Herculaneum, Selby and Chihuahua projects are slag fuming plants.

Among the new projects now coming into expanded production are the Calumet and Hecla Company property at Shullsburg, Wisconsin, which commenced producing this year and will have an annual production of 15,000 to 18,000 tons of zinc and the Pend Oreille Mines and Metals Company property at Metaline Falls, Washington, which also will produce approximately 18,000 tons a year. These properties and increased production from others, including such operations as the Anaconda zinc mines in Montana, will bring the total probable production to 730,000 tons in 1952.

Developments are under way to make the Pend Oreille district one of the big zinc producing areas of the country. And it is predicted from Montana that the Butte operation of Anaconda Copper Mining Company will become the greatest producer of zinc in the United States.



Some Important Zinc Expansion Projects, and Additional Tonnages Anticipated in 1953 or Earlier

Company and Location	*1953*
St. Joseph Lead Company	
Balmat, New York	13,400
Herculaneum, Missouri	7,700
Indian Creek, Etc., Missouri	9,000
Universal Exploration Company	
Jefferson City, Tennessee	9,000
American Smelting and Refining Co.	
Selby, California	10,000
Corpus Christi, Texas (Chihuahua, Mexico)	20,000
Van Stone, Washington	10,000
Compania Minera, Guatemala	20,000
Cerro de Pasco Company, Peru	12,000

New Jersey Zinc Company has very extensive plans for increased production under way, particularly at Ogdensburg, New Jersey; Friedensville, Pennsylvania; in Colorado and Virginia, but it is reported that the increased production will replace ore lost when the Franklin ore deposit is exhausted in another few years.

Central milling and custom flotation plants for the treatment of complex lead-zinc ores have made possible large-tonnage mining of low-grade ores and greater use of underground mechanization. Improved metallurgy is responsible for better recoveries of the mineral content of low grade and complex ores thus allowing mines to operate that otherwise would find it impossible under existing conditions of high wages and inflationary costs.

Horizontal retorts producing about 40 percent of the country's zinc, as Prime Western, are treating greater tonnages in larger furnaces and making higher metal recoveries. Recent developments include the use of mechanical charging machines and the recovery of more by-products from retort residues.

The vertical retort process is continuous and smelts a wide range of zinc ores with high recovery. A new battery of vertical retorts and accessories in operation at the Palmerton Pennsylvania, plant of New Jersey Zinc Company incorporates in the design new recuperators, autogenous cokers, and splash condensers.

A new electrothermic furnace is planned for operation at the Josephtown, Pennsylvania, plant of St. Joseph Lead Company early in 1952. Longer furnace life, low cost and higher production are reported for the process and some continued improvement is expected.

Cerro de Pasco Corporation has announced it would build in Peru the first commercial Sterling electric arc furnace for smelting zinc concentrates. It is understood that assistance for this expansion program has been made available by the Export-Import Bank.

The process was developed by New Jersey Zinc Company. It is reported that a full scale furnace for development work has been in operation at its Palmerton plant for several months. It is reported, also, that the company has a fluid bed roasting process for treating zinc concentrates in an advanced stage of development.

Nearly 15 percent of the zinc of domestic origin in 1950 came from lead furnace slag treatment plants. Production from this source is being expanded substantially.

Reports from Washington indicate that zinc requirements of the free world exceeded refinery and smelter production by approximately 110,000 tons for the last three months of 1951.

On October 1, 1951, the Copper-Zinc-Lead Committee of the International Materials Conference allocated zinc to the United States for the fourth quarter of 1951 at the annual rate of 1,007,324 short tons. This is about 10 percent less than the estimated supply for 1951 available to the United States from domestic mine production including oxide, old scrap and imports. For the first quarter of 1952, the allocation is approximately 252,426 short tons, or at the annual rate of approximately 1,009,700 tons.

The domestic mining industry can go far toward overcoming existing shortages of zinc and providing adequate production for future needs if assured of constructive treatment of its tax problems and afforded at least the same consideration and advantages given by our Government to foreign properties.

It takes several years to develop new mines. And they cannot be brought into production while development proposals are delayed awaiting approval in Washington. But whenever zinc can be produced profitably with some assurance of market stability there is every indication that supplies will be adequate for the foreseeable future.

UNITED STATES MINING REPORT

ALASKA

Platinum and Tin Lead 1951 Minerals to Postwar Peak

Despite the fact gold production in 1951 dropped to its lowest level since 1945, total mineral production during the year reached a postwar peak of $18,000,000. Accounting for the rise was increased production of platinum, tin, coal, and sand and gravel.

Gold production—amounting to 205,452 troy ounces—was 83,820 troy ounces below that of the previous year. Placer operations accounted for the bulk of production, only three lode properties operating during part of the year. High operating costs resulting from inflationary effects of the defense construction industry accounted for the decline. Numerous operators found it more profitable to rent mechanical equipment to contractors than to use it in mining operations.

Goodnews Bay Mining Company continued its placer platinum operations in the Kuskokwim region, 1951 production being higher than that of the previous year. Silver, recovered for the most part as a by-product of gold mining operations, dropped 47 percent below 1950's production to 27,760 fine ounces. Although figures are not available for publication, tin production from two operations on Seward Peninsula was above that of the previous year.

Probably the most significant development during the year was the renewed attention devoted strategic and critical mineral deposits. While, with exception of tin, actual production was negligible, exploration activities indicate substantial future production. More important, these operations are doing much to knock down the psychological block—correcting mistaken impressions that have become firmly fixed in the minds of many large United States operators regarding Alaskan mineral development possibilities. Four DMA loans were granted: two covering tin operations, one nickel-copper-cobalt, and the other for tungsten. Numerous other applications were on file at the end of the year awaiting official action.

Exploration for radioactive minerals continued. Evidences of radioactivity have been noted in various parts of the Territory, all the way from the lower tip of southeastern Alaska to Seward Peninsula. As yet, no major finds have been reported. To assist in the search, an Alaskan Trace Elements unit of the United States Geological Survey has been established at Fairbanks.

Southeast Alaska: Activities in the region primarily were devoted to exploration, the only production coming from the Edgecumbe Exploration Company, which operates a lode gold property near Sitka. No tungsten was produced by the Riverside mine near Hyder. The principal event of the year was the resumption of investigations by the Admiralty-Alaska Gold Mining Company of its nickel-copper-cobalt prospect at Funter Bay, near Juneau, which holds promise of becoming a major United States producer. Successful development of this property should accelerate further exploration of nickel deposits on Yakobi and Chichagof islands. Interest also was expressed in occurrences of antimony, lead-zinc, copper, and molybdenum, as well as large magnetite deposits near Haines and Juneau. The latter were studied with the possibility in mind of exporting iron ore to Japan.

South Central: A small amount of gold was produced at the lode operations in the Willow Creek district by Alaska-Pacific Gold Mining and Black Butte Mining companies. Exploration and development work continued in the Wrangell range region on the Radovan prospect by Alaska Copper Mines, Inc. Other deposits were investigated in this district, which produced more than one billion pounds of metallic copper between 1911 and 1939.

A small amount of pumice was produced in Katmai National Monument on the Alaska Peninsula. Although remote from population centers and inaccessible to visitors, the Department of the Interior blocked further development by prohibiting the concern from continuing its operation in the Monument. Considerable interest was expressed in sulphur occurrences on the Peninsula and Aleutian Island region.

Kenai Peninsula chromite deposits were re-examined and private operators commenced negotiations with U. S. Vanadium Company to lease the property. The DeCoursey Mountain Mining Company, holder of extensive mercury deposits in the Kuskokwim River region, was taken over by new owners, who plan to resume operations.

Interior-Yukon: United States Smelting, Refining and Mining Company operated five dredges in the Fairbanks area, making it the largest single gold producer. Aside from gold operations, which provide the backbone to Alaska's mining industry, considerable attention was paid other minerals in this district by prospectors and small mining operators. The Alaska Metals Mining Company received DMA assistance for exploration of a tungsten property. Other tungsten properties, as well as occurrences of lead, zinc and antimony, came under investigation. Interest also was expressed in the exceptionally large, low-grade copper-molybdenum-silver-gold deposit at Orange Hill. Adjacency of the deposit to low-cost hydroelectric sites, including the fact that ore could be mined by strip methods, offered some attraction to potential operators.

Northwest-Arctic: Three dredge operations were conducted by The United States Smelting, Refining, & Mining Company. Principal non-gold operations included those of U. S. Tin Corporation and Zenda Gold Mining Company on Seward Peninsula, the largest tin producing region under the American flag. Both companies received DMA assistance for development of tin properties. The former company is extending its operations from placer to lode, which would enable it to operate on a year-round basis. Tungsten would be recovered as a by-product.

Native Bismuth, Inc., continued exploration of its bismuth prospect at Charley Creek, north of Nome. Tungsten properties in the area also were investigated. A small amount of jade was produced in the Kobuk River region. Prospectors, as well as United States mining concerns, expressed interest in antimony, graphite and mica prospects on Seward Peninsula, as well as asbestos found in the Kobuk River region.

General: Encouraging to development of the Territory's strategic and critical mineral deposits was the aggressiveness displayed by the U. S. Bureau of Mines, especially by its director of the Alaska region, S. H. Lorain. The Bureau, in company with the Alaska Development Board, strongly is urging DMPA to establish ore-purchasing depots in Alaska. Owing to high labor and transportation costs, small mining operators are confronted with an almost insurmountable obstacle in bringing properties into production on a paying basis. Ore-purchasing depots would provide the incentive required to encourage the small operator to proceed with development plans. Realizing the basic importance of gold mining, the Alaska Development Board continued to support groups urging an increase in the price of gold.

Production of Gold, Silver, Copper and Lead in Alaska from 1941 Through 1951

Year	Gold Ounces	Silver Ounces	Copper Tons	Lead Tons
1941	695,467	191,522	72	662
1942	487,621	119,704	22	415
1943	99,583	42,788	27	200
1944	49,296	13,362	2	44
1945	68,117	9,983	5	11
1946	226,781	41,793	2	115
1947	279,988	66,150	12	264
1948	248,395	67,341	16	329
1949	229,416	36,056	4	51
1950	289,272	52,638	6	149
1951[1]	205,452	27,760	1	21

[1] Estimated.

ARIZONA

All Time High Copper Output As Four Major Mines Developed

Arizona's mining industry in 1951 broke two previous production records. First, the production of copper, 417,000 tons, exceeded that of any prior year; and second, the total value of the gold, silver, copper, lead and zinc produced, $236,360,686, was the greatest in the state's history.

Arizona again ranked first among the states in both copper output and in the total value of the five metals. The state

was fourth in silver, fifth in gold and sixth in lead and zinc.

The production of copper in 1951 was three percent greater than the 1950 output of 403,301 tons, but exceeded by only a narrow margin the record established in 1929 when 414,603 tons were produced. The 1951 copper production was valued at $202,662,000 and accounted for 86 percent of the total value of the five metals.

As has been true for several years, the Morenci mine of Phelps Dodge Corporation was by far the largest producer of copper in Arizona, but its output in 1951 was about seven percent lower than in 1950. It was followed by the New Cornelia mine of Phelps Dodge, Ray mines of Kennecott, Inspiration Consolidated, Copper Queen of Phelps Dodge, Miami, Castle Dome, Magma, United Verde of Phelps Dodge, and Bagdad. These 10 mines contributed about 412,070 tons, compared to 399,711 tons produced in 1950 by the same 10 mines, or 99 percent of the state's total.

Copper ore production increased from 41,757,273 tons in 1950 to 42,850,000 tons in 1951, largely due to increased output by the open-pit properties. The six open pits—Ajo, Bagdad, Inspiration, Castle Dome, Morenci, and Ray—produced 34,300,000 tons of copper ore in 1951, compared with 33,358,059 tons in 1950.

In contrast to the increased copper output, a 34 percent decline in the state's production of lead was recorded in 1951. Production of lead totaled 17,300 tons in 1951, compared to 26,383 tons in 1950. The decline was largely occasioned by the lower output of zinc-lead ore at the Copper Queen Branch, Phelps Dodge Corporation where the zinc-lead ore is gradually being depleted.

The chief producers of lead in 1951, in order of output, were the Mammoth-St. Anthony at Tiger, the Iron King of Shattuck-Denn at Humboldt, Eagle-Picher's San Xavier at Sahuarita, the Flux property of Asarco at Patagonia, the Copper Queen at Bisbee, and the Aravaipa mine of Athletic Mining and Smelting at Klondyke.

Arizona's zinc production also declined, but the drop was not as great as for lead. The output in 1951 amounted to 53,000 tons, a 12 percent loss from the 60,480 tons produced in 1950.

The chief zinc producers in 1951, in order of output, were the Iron King at Humboldt, United Verde at Jerome, Magma at Superior, San Xavier at Sahuarita, Copper Queen at Bisbee, the Flux group near Patagonia, Mammoth-St. Anthony at Tiger and the Republic-Mammoth property of Coronado Copper and Zinc Company near Dragoon.

Gold production in Arizona in 1951 continued at a high level and totaled 118,100 ounces, valued at $4,133,500. The 1950 production was 118,313 ounces. Nearly 72 percent of the gold production was recovered as a by-product of copper ore, with less than 100 ounces recovered in placer operations. Six properties, New Cornelia, Copper Queen, Iron King, Magma, Morenci, and United Verde, produced 92 per cent of the state's gold in 1951.

Arizona's production of silver in 1951 was 5,165,000 ounces, a decline of three percent from the 1950 output of 5,325,441 ounces, and was valued at $4,674,586. Most of the state's silver is recovered as a by-product of copper and lead-zinc mining.

The six copper smelters in Arizona operated throughout the year except for

the usual shutdown for vacations in the summer. The state has no lead or zinc smelters, and all lead concentrates produced at mills in the state in 1951 were shipped to the lead smelter at El Paso, Texas, and zinc concentrates were shipped to zinc smelters in Texas, Oklahoma, Missouri, and Montana. About 90 percent of all ore produced was treated in 36 concentration mills and in two copper leaching plants, with most of the remainder being shipped crude to smelters.

The year 1951 brought to Arizona developments which may mean four major copper producers within the near future, and also intensive exploration for a wide variety of metals and minerals.

Largest of the copper projects is the San Manuel mine near Tiger, under development by Magma Copper Company. The No. 1 Shaft, a four-compartment shaft supported by steel sets and lined with reinforced concrete, was nearing its depth objective of approximately 2,100 feet. The No. 2 Shaft, a three-compartment timbered shaft, was completed to a depth of 2,064 feet and several hundred feet of underground drifts and crosscuts were driven. Water, encountered at 300 feet in the No. 2 and at 1,100 feet in the No. 1 Shaft, was at times excessive and slowed the sinking.

Although final financial arrangements had not been announced at the year's end, it was known that Magma was negotiating with RFC for a loan, variously estimated from $75,000,000 to $100,000,00 to complete the development program and provide the necessary mining, milling, transportation and community facilities. Contracts with the government for accelerated amortization and a guaranteed floor price were still pending. Plans call for mining at the rate of 30,000 tons of ore daily, with an annual output of approximately 70,000 tons of refined copper a year. Production is not expected before 1954 or possibly 1955.

In the Globe-Miami district, Miami Copper Company made splendid progress with its preparations for production from the Copper Cities Mining Company. The Defense Materials Procurement Agency has agreed to buy, at 23 cents per pound, up to 170,000,000 pounds of the first 192,000,000 pounds of copper produced, if the metal cannot be sold at a higher price to other purchasers. Approximately $7,500,000 of the estimated $15,200,000 cost will be provided through an RFC loan. The first million tons of overburden had been stripped from the deposit by mid-September. The Copper Cities property is scheduled for production by the time Miami Copper Company's other subsidiary, Castle Dome Mining Company, has exhausted its ore body in the fall of 1954. Output will be at an annual rate of 22,500 tons of copper.

Phelps Dodge Corporation's new mine at Bisbee—the Lavender Pit—is taking shape rapidly. Here Phelps Dodge is preparing to mine about 41,000,000 tons of concentrating ore averaging 1.14 per cent copper, and to treat by leaching some 31,000,000 tons of material averaging 0.42 percent copper. The pit eventually will be about 2,000 feet wide, 3,800 feet long, and 600 feet deep, and will require the removal of 70,000,000 tons of waste material. As a preliminary to the pit's development, the company had to move more than 250 residences, 10 business establishments, the railroad and highway. The entire cost, estimated in excess of $25,000,000, of developing the Lavender Pit for mining the Bisbee East Ore Body, will be financed by Phelps Dodge. The government is assisting by permitting accelerated amortization of about 75 percent of the total cost and by guaranteeing a floor price for the metal produced. Under the terms of the contract, Phelps Dodge has been granted a floor of 22 cents a pound for 112,500 tons of the first 150,000 tons produced. The new concentrator and leaching plant, to be built, should boost copper production 38,000 tons a year, beginning in 1955.

An agreement between American Smelting and Refining Company and the Defense Minerals Administration is scheduled to bring into production the Silver Bell copper property in Pima County, northwest of Tucson. The cost of this development is estimated at $17,000,000, and will be financed entirely by the mining company.

Under the agreement, if the company is unable to sell the copper from Silver Bell on the open market for 24.5 cents a pound, the government will buy at that price up to 177,000,000 pounds of the first 197,000,000 pounds produced. Production is expected to get underway in about two years, and the government's responsibility to buy the copper expires after 5½ years from the start of production. It is believed that the mine will produce at the rate of 36,000,000 pounds annually over a period of about 12 years. Rapid amortization has been granted for 85 percent of $10,963,145 to be spent in expanding facilities.

The Silver Bell is an old property with an important production record from underground workings. According to present plans, the mine is to be converted to

Production of Gold, Silver, Copper, Lead and Zinc in Arizona from 1941 Through 1951

Year	Gold Ounces	Silver Ounces	Copper Tons	Lead Tons	Zinc Tons
1941	315,392	7,498,260	326,317	15,638	16,493
1942	253,651	7,064,467	393,387	14,772	18,522
1943	171,810	5,713,889	403,181	13,727	19,677
1944	112,162	4,394,039	358,303	16,707	29,077
1945	77,223	3,558,216	287,203	22,867	40,226
1946	79,024	3,268,765	289,223	23,930	43,665
1947	95,860	4,569,084	366,218	28,566	54,644
1948	109,487	4,837,740	375,121	29,899	54,478
1949	108,993	4,970,736	359,021	33,568	70,658
1950	118,313	5,325,441	403,301	26,383	60,480
1951[1]	118,100	5,165,000	417,000	17,300	53,000

[1] Estimated.

Inspiration Consolidated Copper Company expanded open pit mining of the upper portions of its porphyry copper ore body during 1951.

an open-pit operation, with truck haulage from the pit to the concentrator. It will be necessary to construct complete camp facilities, including housing, mine offices, shops, and a 7,500-ton flotation mill. The deposit is estimated to contain 33,000,000 tons of ore averaging slightly less than 1.0 percent copper.

It is interesting to note that three of the four new developments are to be open-pit operations.

Bagdad Copper Corporation, which in 1950 reported copper ore production from its open pit at 90,000 tons per month, increased its output to 110,000 tons monthly in 1951. Late in the year serious consideration was being given to plans which would more that double present capacity. Ore reserves were estimated at 20,000,000 tons of 0.9 percent copper.

At the Ray Mines Division of Kennecott Copper Corporation, improvements were completed which increased the mine's productive capacity to 15,000 tons a day from pit and underground. An expenditure of about $5,500,000 during the last three years had been required to cover the cost of the open-pit crushing plant, remodeling the old crushing plant, purchasing shovels, trucks and auxiliary equipment for operating the pit, and for increasing milling facilities from 7,500 to 15,000 tons of ore per day.

Important exploration programs were in progress in all sections of the state. Among these were the continued diamond drilling in Graham County by Consolidated Coppermines Corporation; drilling in Pima County by Anaconda Copper Company; shaft sinking by the Golden Crown Mining Company near Humboldt; geophysical exploration, drilling and shaft sinking by the Pima Mining Company, near Sahuarita; Shattuck Denn's exploration at the old Kay Copper property; and a large drilling program in Mohave County. None of these had advanced sufficiently that the companies were willing to make definite announcements concerning discoveries or production plans.

The mine-loan program of Defense Minerals Administration created a great deal of interest, but at the year's end only six loans had been authorized for Arizona properties as follows: Ike Kusisto for a lead exploration in Yavapai County; Banner Mining Company, two copper projects in Pima County; American Cement Asbestos Corporation, an asbestos project in Gila County; Eugene J. Meyer, a copper project in Yavapai County; and Sherwood B. Owens, a zinc-copper project in Cochise County. All were for comparatively small amounts.

The government's purchase programs for tungsten and manganese stimulated exploration for those two metals, but production was limited and brought inadequate returns to the small producers, because of high transportation and milling charges.

The search for uranium continued throughout the year, with noteworthy production reported from two properties on the Navajo Indian Reservation in northeastern Arizona. The principal operators were the Vanadium Corporation of America, producing 2,500 tons uranium-vanadium ore monthly, and the Navajo Uranium Company, producing 1,200 tons monthly. With the completion of a sampling plant and milling facilities at Shiprock, New Mexico, the latter company expects to more than double its production. During the year, the U. S. Geological Survey examined more than 40 different uranium prospects in Arizona on behalf of the Atomic Energy Commission, and reported that the most promising prospects were located in the northern part of the state.

The increased demand for asbestos for the rearmament program created a mild boom for Arizona asbestos. Globe is the center of activity, and the three mills operating there are furnishing a market for the small producers as well as for the companies' own production. In addition, several companies have their own mills at or near the mines.

Further progress in the field of nonmetallics was made in 1951. The production of ground barite for oil well drilling was continued by Arizona Barite Company at Mesa; a limited output of beryl was maintained from deposits in southern Yavapai County; the cement plant of Arizona Portland Cement Company at Rillito, west of Tucson, was doubled in capacity to 4,000 barrels per day; production of flagstone showed a steady increase; the mica industry continued to grow, with five grinding plants in operation during the major portion of the year; and some production of fluorspar was reported.

No estimate can be given of the value of the state's output of miscellaneous metals and nonmetallics, but it is safe to say they made an important addition to the record-breaking total of $236,360,686 reported for the five major metals—gold, silver, copper, lead and zinc.

CALIFORNIA

Lead and gold Production Down, Other Metals Show Increases

As in other mining areas, the defense materials procurement programs set up by the federal government early in 1951 increased activity in the California minerals industry. Though preliminary figures on overall metal production showed a slight decrease from 1950 totals, this was due largely to a 17 percent drop in gold recovery. Other metals, particularly those considered critical, showed marked increases in both production and development. Higher prices and government exploration, production, and purchase contracts appeared to insure even greater expansion for 1952.

Gold production, representing 56 percent of California's total dollar value of base and precious metal production ($21,258,782), decreased $2,500,000 from 1950 figures. This cut-back was due to (1) the profit squeeze in lode mining caused by increased costs and a stable price, (2) depleted placer deposits, and (3) placers abandoned because of unsolved operational problems.

Silver production, other than that incidental to gold recovery, came largely from base metal mines in three counties: Inyo, Shasta, and Calaveras. Total recovery increased 3 percent in 1951 due to greater activity at the base metal properties.

Copper production showed a 30 percent expansion. Except for minor small-mine activity, the state's copper, like its silver, is a byproduct of other base-metal mines and production followed base metal increases. Some copper concentrate came from milled tungsten ore out of U. S. Vanadium's Pine Creek mine in the Bishop district.

Lead production, largely from Anaconda Copper Mining Company's Darwin and Shoshone mines, increased nearly 10 percent in dollar volume. The advance, however, is indicative only of price increases, not tonnage figures, since a drop of 2,100 tons was reported. Many important producers had expanded facilities during the year and the fall months showed a sharp increase in production. If the present rate of expansion is maintained, 1952 will be a record breaking year.

Zinc production, nearly all from only four mines, increased five percent. The tonnage increase was somewhat less due to higher prices. Zinc output has grown steadily since 1947 and, barring changes in the economic atmosphere, the trend will continue through 1952.

Mercury production, in which California was the number one state, expanded from 3,400 flasks in 1950 to about 5,000 flasks in 1951 according to preliminary reports of the California Division of Mines. Higher prices prompted expansions throughout the state with at least 15 former producers reporting rehabilitation of mines and furnaces. During August DMA loans increased exploration at both old and new properties and 1952 production will undoubtedly show substantial advances.

Tungsten production increased but slightly over 1950 though California continued to lead the nation. The only significant new producer was the Starbright mine northeast of Barstow but, with the activity in exploration and development evident in producing areas in the Bishop, Atolia, Fresno, and Kerneville districts, 1952 production will be pushed to record highs.

Manganese production was stimulated early in 1951 and many properties were active with production of both metallurgical and battery grade manganese reported. New developments, such as Teekay Mines' operations near Tracy, will increase output even further during the coming year.

Chrome production, centered in the northern Sierra, was slight during 1951 but seemed to have a secure future through the government stockpiling and purchasing program. Full production from

Production of Gold, Silver, Copper, Lead and Zinc in California from 1941 Through 1951

Year	Gold Ounces	Silver Ounces	Copper Tons	Lead Tons	Zinc Tons
1941	1,408,793	2,154,188	3,943	3,464	440
1942	847,997	1,450,440	1,058	5,151	613
1943	148,328	609,075	8,762	5,820	1,856
1944	117,373	778,936	12,721	5,682	8,455
1945	147,938	986,798	6,473	7,224	9,923
1946	356,824	1,342,651	4,240	9,923	6,877
1947	431,415	1,597,442	2,407	10,080	5,415
1948	421,473	724,771	481	9,110	5,325
1949	417,231	783,880	649	10,318	7,209
1950	412,118	1,071,917	696	15,831	7,551
1951[1]	340,567	1,112,288	830	13,700	9,060

[1] Estimated.

most of the operations should be reached in 1952.

Iron ore production showed a steady expansion to a record output of about 1,500,000 tons in 1951, largely from Kaiser Steel Corporation's Eagle Mountain mine in San Bernardino county.

Antimony and Molybdenum production, though minor, both experienced increases during the year with continued development predicted for 1952.

Magnesium production was renewed for the first time since World War II with the reactivation of government plants and 1952 output will be greatly increased.

Rare earths production is expected to begin in 1952. Large reserves discovered near Mountain Pass in San Bernardino county were being explored and developed during 1951.

California scheelite miners were busy during night time in 1951 to better select and mine their ore indicated by ultra violet lights.

CENTRAL STATES

Zinc Output Up, Lead Down, Aluminum and Steel Expand

Southeast Missouri and the Tri-State district experienced a drop of nearly nine percent in combined lead production during 1951 though, because of higher prices, the dollar volume was over 17 percent greater. Since somewhat greater tonnages of ore were mined, the lower recoverable metal production can be largely attributed to the continually lessening tenor of Tri-State ores. The failure of the St. Joseph Lead Company's Herculaneum plant in Southeast Missouri to reopen after being strike bound in October was a second factor in lowered output. Nevertheless, Missouri's two producing areas combined to make the state for the 44th consecutive year the nation's biggest supplier of lead. The St. Joseph Lead Company's mines in Southeast Missouri made that company the largest individual producer of lead in the United States.

Production of Lead and Zinc in Missouri from 1941 Through 1951

Year	Tons Lead	Tons Zinc
1941	165,909	21,932
1942	199,548	36,394
1943	184,910	30,413
1944	174,683	36,626
1945	176,575	22,175
1946	139,112	22,234
1947	132,246	17,074
1948	102,288	6,463
1949	127,522	5,911
1950	134,626	8,189
1951[1]	125,928	10,563

[1] Estimated.

Zinc production from the two districts, unlike lead activities, advanced nearly 13 percent, representing a gross income increase of over 42 percent. Whereas 80 percent of the reported lead production of the two districts came from Southeast Missouri, 95 percent of the zinc produced can be attributed to Tri-State operations. With 26 mines in operation, the Eagle-Picher Company continued to lead the Tri-State in both lead and zinc production. The American Zinc, Lead and Smelting Company, which acquired the holdings of the Nellie B. Mining and Milling Company in October, was the district's second largest producer. The Midwest Mining and Milling Company, formerly the Fredricktown Lead Company, continued to develop its Catherine and Fleming mine.

Mine Production of Lead and Zinc in Kansas from 1941 Through 1951

Year	Lead Tons	Zinc Tons
1941	14,538	71,403
1942	9,419	55,874
1943	9,213	56,944
1944	9,394	63,703
1945	7,370	48,394
1946	6,445	47,703
1947	7,285	41,497
1948	8,386	35,577
1949	9,772	29,433
1950	9,487	27,176
1951[1]	9,833	29,825

[1] Estimated.

Byproduct copper in Southeast Missouri decreased 30 percent whereas silver values, also a byproduct in the district, showed a modest increase.

Silver, lead, and zinc production in Wisconsin, Kentucky and Illinois increased sharply in 1951. Decreased output from Northern Illinois mines was offset by increases in Southern Illinois and Kentucky with the Ozark-Mahoning Company, Minerva Oil Company, and United States Steel Company showing rapid expansion of their fluorspar operations, which produce silver, lead and zinc as byproducts or coproducts. Alcoa Mining Company's enlarged operations at the Hutson zinc mine accounted for much of the increase for that metal in Kentucky. With other major lead-zinc producers continuing and expanding their operations in Wisconsin, the Mifflin Mining Company set the trend wth over $200,000 in DMEA exploration contracts and an $80,000 DMPA development loan. An interesting DMEA contract for zinc-lead exploration was active in Dubuque county, Iowa, a state that has reported no production for several years.

Production of Lead, Zinc and Gypsum in Oklahoma from 1941 through 1951

Year	Tons Lead	Tons Zinc	Tons Gypsum
1941	25,021	166,602	258,258
1942	22,806	146,510	243,545
1943	19,732	114,085	371,893
1944	13,944	91,449	295,604
1945	12,664	69,300	32,343
1946	13,697	69,552	138,314
1947	14,289	51,062	239,468
1948	16,918	43,821	292,605
1949	19,858	44,033	355,590
1950	20,724	46,739	339,746
1951	16,459	51,999	(2)

1. Estimated.
2. Not Available.

Steel production in Texas will continue to expand with secondary production soon to come from the nearly-completed Lone Star and LeTourneau plants at Daingerfield and Longview. The Sheffield mill at Houston, now being enlarged, took advantage of its tidewater location and augmented ore supplies from mines in East Texas and Mexico with a recent shipment of high grade Brazilian iron ore.

COLORADO

Uranium, Tungsten, Base Metal Mining Up Due to Higher Price

The mining of uranium ores in Colorado increased greatly during 1951. The increase in production can be attributed to two major factors: 1) The increased activity is a direct result of an industry stimulated and stabilized for the time being through adequate recompense for its labors and capital risks. The increased price schedule for uranium ores enabled the miners to invest in new and better equipment and to perform additional exploratory and development drilling and development work. 2) The increased activity is also directly attributable to the Government exploratory drilling program performed during 1949 and 1950.

The uranium mining industry is now one of the largest industries in the State of Colorado. Deposits located in Mesa, Montrose and San Miguel counties are now producing the majority of the nation's supply, and they are now supplying all or part of the mill requirements for the Rifle, Grand Junction, Uravan, Naturita, and Durango, Colorado, and the Monticello, Utah, processing plants.

The areas in the immediate vicinity of Uravan, Mesa County, including the East Paradox, Dolores, Club, and Long Park areas, comprise the backbone of uranium production. Exploitation of many new deposits in these areas was begun during 1951, primarily as United States Vanadium Company and Atomic Energy Commission leases. Next in importance are the large producing areas on Calamity and Outlaw mesas, Mesa County, and the Slickrock area of San Miguel County. The rest of the Colorado carnotite production comes from areas of smaller tonnage potential, such as, Mesa Creek, West Paradox, Bull Canyon, and Gypsum Valley.

Characteristically, approximately 75 percent of current uranium production was obtained through the labors of independent operators, lessees and contract miners. The majority of the operators, because of the inherent nature of uranium deposition and the high cost of drilling, are not technically nor financially able to efficiently explore and develop their properties. The maintenance and expansion over current peak production is dependent to a large extent on increased Government exploratory and development drilling as well as the continuance of an adequate price schedule.

Activity in Boulder County increased greatly with the advent of the substantially higher tungsten price. Development loans stimulated the reopening and rehabilitation of many properties. The Boulder Tungsten Mines, Inc., was organized in July to operate the Dorothy-Katie, Gold Coin and Princess group of mines, and they also acquired the Marion mill, which is being remodeled to handle 40 to 50 tons of ore per day. The Vanadium Corporation of America leased the Wolftongue mill in November. The mill is being redesigned and improved in order to handle 100 tons per day, and present plans are to develop sufficient ore reserves on company account to assure the mill of a steady supply.

In Gunnison County, extensive exploration and development work was carried on by the American Smelting and Refining Company in conjunction with Park City Consolidated. The Callahan Zinc-Lead Company, the only major producer in the County, also carried on extensive exploration and development as a result of a Government exploration and development loan.

Activity in Clear Creek County was comparable to the preceding year. Twenty mines shut down, but 21 new operations started. The Terrible-Dunderburg Mine, operated by Gold Mines Consolidated, Inc., had the largest production in Clear Creek County during 1951.

The Rico-Argentine Mining Company in Dolores County increased production as a result of the extensive development work performed the preceding year.

In the Cripple Creek area, the new Carlton Mill, which was designed to treat all Cripple Creek ores as well as those from other areas, was dedicated in March. The capacity of the mill can vary between 300 and 1,000 tons per day. During the early part of the year several mines were rehabilitated in preparation for the opening of the mill. The Cripple Creek operations of the Golden Cycle Corporation concentrated work at the Ajax mine. Fourteen thousand tons were shipped from the Bobtail vein that averaged $28.00 per ton. The Cresson mine shipped an estimated 26,000 tons with an average value of $15.00 per ton.

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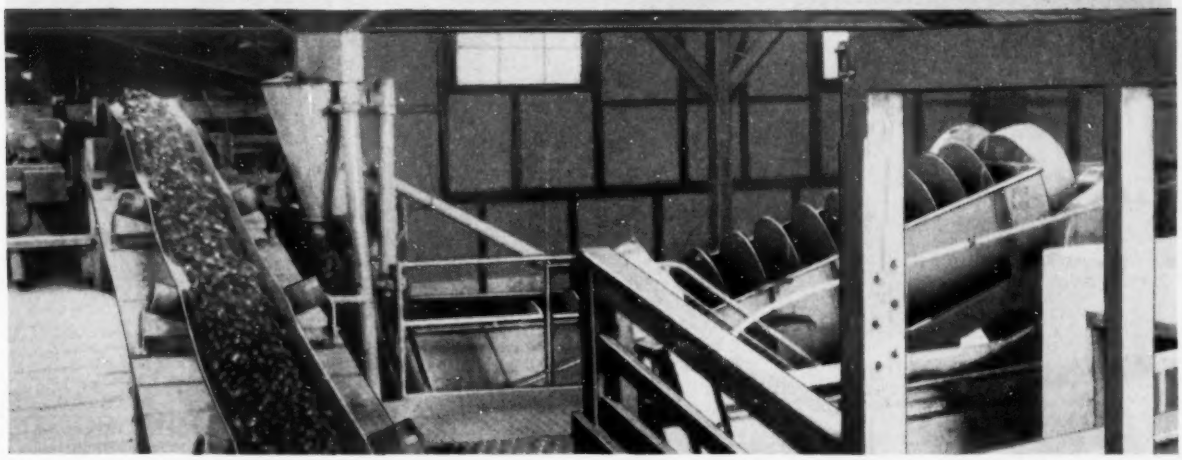

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Coal (Jig Middling) (Bituminous) 1½" top size	Feed Float Coal Middling Refuse	62.3% ash 27.5% ash 40.7% ash 78.0% ash	diverted to refuse	U. S. Coal & Coke Co.	1949
Garnet 1" top size	Feed Tailing Middling Concentrate	no sample 2.8% garnet 32.9% garnet 91.5% garnet	recrushed & recycled to HMS	Barton Mines Co.	1948
Zinc ore 1½" top size	Feed Tailing Middling Concentrate	2.00% zinc 0.63% zinc 9.28% zinc 36.00% zinc	recrushed for flotation feed	Eagle Picher Mining & Smelting Co.	1946 *
Iron Ore (Mesabi) 1" top size	Feed Tailing Middling Concentrate	44.57% Fe 12.39% Fe 36.52% Fe 57.76% Fe	diverted to tailing	M. A. Hanna Co.	1951 *
Iron Ore (Alabama Red Ore) 4" top size	Feed Tailing Middling Concentrate	57.76% Fe *operations just started, no data available*	stockpiled for future treatment	Sloss-Sheffield Steel & Iron Co.	1951

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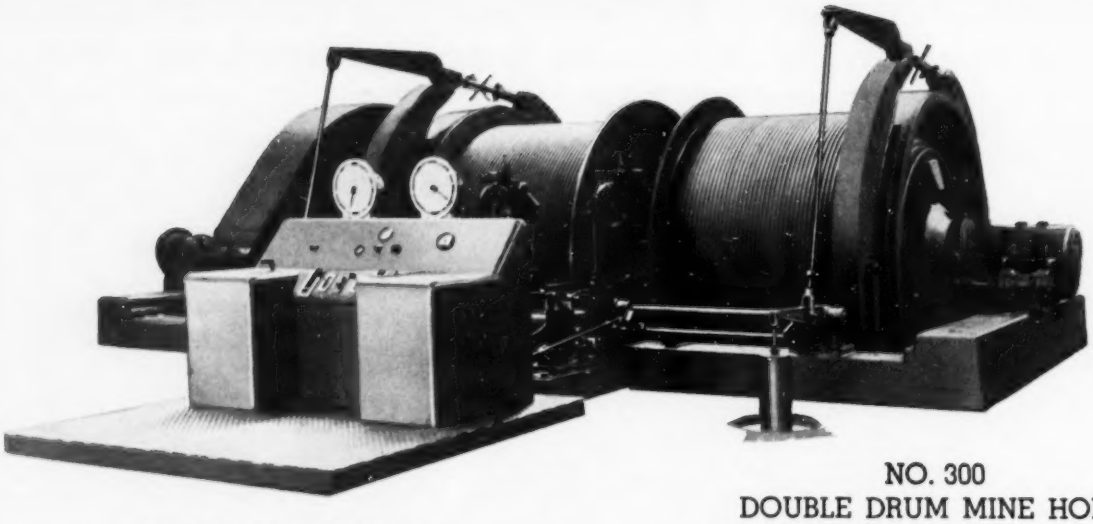

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The Hinsdale County operation of the Colorado Standard Lead-Zinc Mines, Inc., rapidly neared the production stage after the consolidation of three old properties, the Ute, Ulay and Hidden Treasure mines. The consolidation has greatly facilitated the operational and development programs.

The 1951 production of gold, silver, lead, zinc and copper in Lake County was close to $6,000,000 in value, which brings the grand total for these metals since 1859 to nearly $492,000,000. The Resurrection Mining Company's mill operated on both company ore and ore from some 25 custom shippers.

In the Ouray-Silverton areas the Idarado Mining Company began a new deep level crosscut adit near Pandora in San Miguel County. The King Lease was milling at the rate of 140 tons per day. The Shenandoah-Dives Mining Company operated its 700 ton mill throughout the year.

In general, mining activity in Colorado was stimulated by increased base metal prices and Government development loans.

A major exploration program was undertaken at the Akron Unit of the Callahan Zinc-Lead Company at Whitepine, Colorado in 1951. Company funds matched DMA funds equally to finance the project.

Production of Gold, Silver, Copper, Lead and Zinc in Colorado from 1941 Through 1951

Year	Gold Ounces	Silver Ounces	Copper Tons	Lead Tons	Zinc Tons
1941	380,029	7,301,697	6,748	12,574	15,722
1942	268,627	3,096,211	1,102	15,181	32,215
1943	137,558	2,664,142	1,028	18,032	44,094
1944	111,455	2,248,830	1,048	17,698	39,995
1945	100,935	2,226,780	1,485	17,044	35,773
1946	142,613	2,240,151	1,754	17,036	36,147
1947	168,279	2,557,653	2,150	18,696	38,745
1948	154,802	3,011,011	2,298	25,143	45,164
1949	102,618	2,894,886	2,403	26,853	47,703
1950	130,390	3,492,278	3,141	27,007	45,776
1951[1]	112,000	2,808,000	3,230	30,400	55,700

[1] Estimated.

EASTERN STATES

Record Ilmenite Production; Important Zinc Discoveries

Paced by iron and zinc mining the Eastern states saw major mine exploration and development programs underway or completed during 1951. Additional concentrating capacity was also being installed at several of the larger operations.

Iron mining in New York's Adirondacks was paced by the Benson Mines operations of the Jones & Laughlin Steel Corporation where an all time high production record was set during the year. The Corporation virtually completed work on its new concentrator which will recover non magnetic martite. At Tahawus, New York the National Lead Company produced about 500,000 tons of magnetite concentrate as a byproduct of its ilmenite mining and concentration. Republic Steel Corporation operated its Mineville and Lyon Mountain iron ore mines in northern New York at capacity during the year.

Biggest iron mine expansion in the east was in Pennsylvania where the Bethlehem Cornwall Steel Corporation started shaft sinking to develop its geophysically-discovered, deep, magnetic orebody. The corporation increased production of underground ore at its Cornwall, Pennsylvania mine as its openpit became depleted.

Eight mining companies produced iron ore in the eastern states during the year. They operated six open pits, 10 underground mines, and 10 beneficiation plants.

Fifteen zinc mines were in operation in the eastern states during the year. Zinc production from these mines increased four percent over 1950 output to 147,393 short tons in 1951. Production was up in New York, New Jersey and Tennessee to more than offset a drop in production from the Austinville, Virginia mine of the New Jersey Zinc Company.

Major developments underway at Friedensville, Pennsylvania by the New Jersey Zinc Company; near Embreville, Tennessee by the Appalachian Mining and Smelting Company; and in the Mascot, Tennessee area by the American Zinc Company of Tennessee will insure increased production of zinc, and some lead, in the future.

Domestic production of ilmenite, concentrated in the east and south east, reached an all time high in 1951 as the MacIntyre Development of the National Lead Company produced a record 270,000 gross tons of ilmenite concentrate. The duPont Company's beach sand treating plant at Starke, Florida also operated at capacity treating about 30,000 tons per day with an output for 1951 of about 120,000 gross tons of concentrate. At Jacksonville, Florida the Rutile Mining Company also recovered ilmenite from beach sands.

In the Florida phosphate fields production continued at a high level. Major plant additions and improvements are under way which assure continued production at lower cost. One of the most important new mines placed in operation during the year was the Tenoroc mine of the Coronet Phosphate Company. New plants and additions to existing washing and flotation plants continued under priority construction for the recovery of byproduct uranium.

Production of Gold, Silver, Copper, Lead and Zinc in States East of the Mississippi River from 1941 Through 1951

Year	Gold Ounces	Silver Ounces	Copper Tons	Lead Tons	Zinc Tons
1941	21,892	106,051	60,006	9,426	207,173
1942	14,699	105,307	59 881	7,929	219,031
1943	2,878	128,129	61,009	8,046	210,402
1944	2,595	124,006	57,470	9,822	199,479
1945	1,857	81,983	42,856	10,069	180,322
1946	1,432	76,964	34,513	11,127	161,876
1947	1,997	137,780	36,875	9,026	181,792
1948	2,479	101,171	42,025	10,706	177,787
1949	1,967	101,612	32,955	9,755	156,298
1950	2,090	111,354	14,497	4,851	141,072
1951[1]	2,511	121,485	16,208	3,046	147,393

IDAHO

Major Exploration Projects And Reopening of Old Mines

The greatest revival of exploration and development in at least a quarter century marked the Idaho mining scene in 1951. Long-abandoned mines were reopened, many new mining claims staked, expensive new projects undertaken. New mining blood came to the state and in the great Coeur d'Alene mining region old, well-established firms found themselves competing with big "outsiders" for properties long ignored. In the Coeur d'Alenes, too, there appeared to be a growing trend for two or three "big" companies to join in developing large groups of claims, and an unprecedented move was made toward consolidating nearly a dozen small, contiguous properties into one company for development by a major operator.

All this was attributed mostly to three factors: Higher prices for base metals than in 1950; tax "breaks" given the in-

dustry by congress, and federal exploration loans.

Twenty-six mineral exploration projects totaling well over $1,000,000 were approved in Idaho by the DMEA in 1951. Among the biggest were $288,000 to Day Mines, Inc., for its National Copper project in the Hunter mining district near Mullan; $200,000 to Highland-Surprise Consolidated Mining Company, a zinc-lead producer in the Pine Creek district near Kellogg; $143,550 to Nabob Silver-Lead, Inc., another Pine Creek operator; $135,000 to Snoose Mining Company for zinc exploration in Blaine County's Mineral Hill district; $123,738 to Idaho Mining Company for lead-zinc exploration at its Moon Gulch property near Kellogg; $97,368 to Bradley Mining Company for additional antimony exploration at its Stibnite, Idaho, Yellow Pine mine. Monazite exploration was encouraged by a 90 percent loan of $12,647 to Ruby Meadows Mining Company in Idaho County.

In Shoshone County alone, nearly 550 mineral locations were filed with the county recorder. More than 300 of these were in the Hunter district, scene of most new activity in the Coeur d'Alene mining region.

Perhaps the outstanding Hunter district development was a $1,000,000 deep-level project undertaken at the old Atlas property by Hecla Mining Company, Newmont Mining Corporation and New Jersey Zinc Company. Hecla took a 10-year lease on the East Silver Belt property between its Rock Creek group and Atlas. Day Mines, Inc., purchased the Gold Hunter, an old producer, and several small adjoining properties; then undertook deep development of Independence Lead Mines ground in partnership with Federal Mining & Smelting Company, a subsidiary of American Smelting & Refining Company. Federal started driving easterly toward Independence ground from the 3,650-foot level of its Morning Mine and Day Mines started unwatering and repairing the Hunter shaft preparatory to driving westerly into Independence ground. Sullivan Mining Company, jointly owned by Hecla and Bunker Hill & Sullivan Mining & Concentrating Company, sponsored formation of Silver Mountain Lead Mines, Inc., to consolidate Sullivan's Lucky Boy group with smaller, contiguous properties, including the old Snowstorm, Idaho Silver and Vindicator, for development by Sullivan. Coronado Copper & Zinc Company, California concern controlled by Cyprus Mines Corporation, entered the district through two subsidiaries, Silver Banner Mining Company and Cortez Silver-Lead Mines. Silver Banner took leases and options on several groups, including the Gold Creek and Gem State, lying between Hecla's Rock Creek and Atlas holdings, and started bulldozing and diamond drilling operations. Cortez acquired large holdings east of the Atlas to the Montana state line. Mullan Metals, Inc., was incorporated to develop the old "Big Four" property west of Mullan. Hometown Mining Company was formed to take over mineral rights under the city of Mullan.

The 300 ton per day selective flotation mill of the Triumph Mining Company was placed in operation in 1951. It is one of the most modern and efficient in the United States.

In the old "silver belt" between Wallace and Big Creek, ASARCO took over the extensive holdings of Silver Buckle Mining Company under an agreement calling for about $1,000,000 worth of exploration and development work. Day Mines took a 25 percent interest in the Silver Buckle project adjoining ASARCO's Galena or Vulcan deep-development project in which it previously had obtained a 25 per cent participating interest. Day Mines also made several small additions to its holdings in this area.

In the Big Creek or Sunshine area of the silver belt, Metropolitan Mines Corporation acquired the adjoining 11-claim Destroyer group. Big Creek Apex Mining Company Silver Syndicate, Inc., and Sunshine Mining Company agreed on division of ore in shoots originating in Silver Syndicate ground and raking into Big Creek Apex Sunrise Mining Company resumed development work.

In the Pine Creek zinc-lead district, Mascot Mines, Inc., undertook extensive development of the Little Pittsburg mine, Spokane-Idaho Mining Company took over development of the old Douglas mine, Sunset Minerals, Inc., acquired the adjoining Idaho group of claims, Silver Bowl, Inc., started an exploration program on the Bobby Anderson group, Signal Mining Company unwatered the old Hilarity workings, Hypotheek Mining & Milling Company leased 640 adjoining acres of state-owned land and started exploring King of Pine Creek ground.

There were fewer ore discoveries than in 1950. Silver Summit made the best in Shoshone County—a new west ore body on its 3,000-foot level. Promising ore structures were found by Sunshine Consolidated, Inc., Hypotheek, Nabob and Coeur d'Alene Mines Corporation in American Silver Mining Company ground.

Bunker Hill & Sullivan started a $1,000,000 improvement program at its Kellogg lead smelter and studied feasibility of constructing plants for recovering sulphur from roaster gases from smelting lead ores and processing zinc ores.

In south-central Idaho, Monsanto Chemical Company of St. Louis, Missouri, announced plans to build at Soda Springs a multi-million dollar plant for converting phosphate rock into elemental phosphorus. Bradley Mining Company expanded production at its Ima tungsten mine and Yellow Pine antimony mine. The company's new $2,500,000 antimony smelter at Stibnite reportedly produced more than 90 percent of the nation's antimony. Development of the Paymaster mine near Arco was assumed by Spokane-Idaho Mining Company. Calera Mining Company's 600-ton mill at its Blackbird mine started producing concentrates containing strategic cobalt. Triumph Mining Company put its new 200-ton selective flotation plant to work. Sun Valley Lead-Silver Mines put its new 100-ton concentrator in full operation on dump ore from the Sunday mine and ore from the Blue Kitten mine. Idaho Custer Mines, Inc., started producing lead-zinc concentrates in its new mill at the Livingston mine in September.

Idaho continued as the nation's leading silver-producing state in 1951, although it mined less silver, zinc, lead, gold and copper than in 1950. Silver output decreased about 9 percent to 14,643,000 ounces; zinc more than 9 percent to 79,800 tons; lead nearly 25 percent to 75,200 tons; gold more than 45 percent to 43,600 ounces, and copper more than 6 percent to 1,970 tons. Total value of the five metals decreased from $70,198,647 in 1950 to $70,002,267 in 1951. Zinc accounted for 41 percent of the total value, lead 37 percent, silver

Production of Gold, Silver, Copper, Lead and Zinc in Idaho from 1941 Through 1951

Year	Gold Ounces	Silver Ounces	Copper Tons	Lead Tons	Zinc Tons
1941	149,816	16,672,410	3,621	104,914	79,084
1942	95,020	14,644,890	3,430	113,909	87,256
1943	30,808	11,700,180	2,324	96,457	86,707
1944	25,008	9,931,614	1,688	83,530	91,372
1945	17,780	8,142,667	1,548	68,447	83,463
1946	42,975	6,491,104	1,038	59,987	71,507
1947	64,982	10,345,779	1,640	78,944	83,069
1948	58,454	11,448,875	1,624	88,544	86,267
1949	77,829	10,049,257	1,438	79,299	76,555
1950	79,652	16,095,019	2,107	100,025	87,890
1951[1]	43,529	14,642,231	1,972	75,164	79,783

[1] Estimated.

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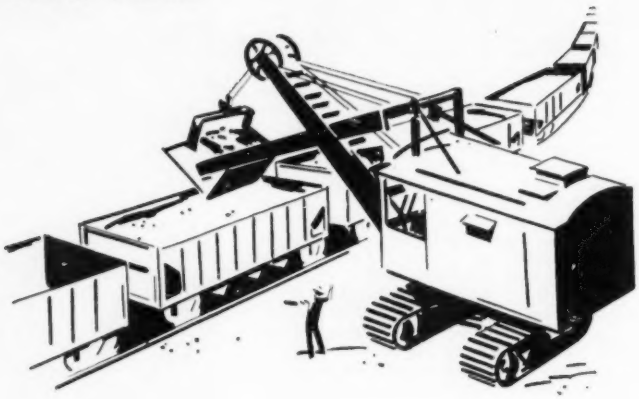

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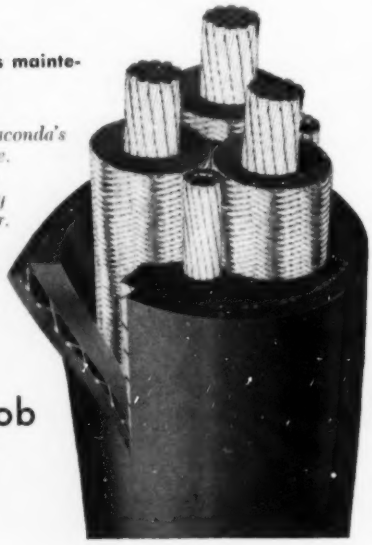

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Shoshone County, comprising the Coeur d'Alene Mining region, yielded nearly 91 percent of Idaho's silver output, 96 percent of its zinc, 92 percent of its lead and 66 percent of its copper. Sullivan Mining Company's Star mine at Burke continued as Idaho's foremost zinc producer, accounting for nearly 24 percent of total output. The Bunker Hill mine remained the leading lead producer. Sunshine Mining Company again was the state's largest silver producer.

LAKE SUPERIOR REGION

Record Year For Iron Mining; White Pine Copper Develops

Metallic ore recovery operations in the Lake Superior district presented a thought provoking picture in the calendar year of 1951. Greatest production of course was centered on the Mesabi Iron Range. And, although trucks of 50-ton capacity were introduced here, larger than ever drag lines and power shovels, the future of this area lies in the hands of engineers beneficiating lower grade ores or taconite. But the clear light of the spectacular was pointed towards Michigan's Upper Peninsula in the year 1951. Iron-wise, the low grade Hematitic Jasper in this area is receiving as much attention as taconite in Minnesota. In this respect one of the two most noteworthy occurrences on all the Michigan Ranges in the year 1951 was the announcement that Cleveland-Cliffs Iron Company and the Ford Motor Company would jointly conduct an open pit operation and build a large beneficiation plant near Ishpeming.

But overshadowing all the advances in iron ore beneficiation as well as new iron mine openings was the announcement late in the year of the $57,185,000 Reconstruction Finance Corporation loan to Copper Range Company, owner of the White Pine copper deposit—one of the largest in North America.

Morris F. LaCroix, president of Copper Range, states that 85 percent of the ore at White Pine can be recovered through the use of new mining techniques. It is estimated by some sources that the life expectancy of White Pine is at least 50 years. When the mine is once more producing, it is expected that sufficient ore to yield 75,000,000 pounds of copper will be removed each year.

Some taconite concentration and agglomeration plants were completed and even more were started on the Minnesota Ranges in the year 1951.

Oliver Iron Mining Company started erection of a single circuit washing plant in connection with the crushing and screening plant at Hull-Rust, world's largest open pit iron mine, Hibbing. Oliver has long been in the lean ore beneficiation picture with its concentrator at Coleraine, and the new plant mentioned above will eliminate the long rail haul of crude wash ore to Coleraine.

M. A. Hanna Company, possibly the most active operator on the Minnesota Ranges, started full scale operation of a beneficiation plant at the Buckeye mine, near Coleraine. This plant, with a capacity of 150 tons per hour, employs a Dutch State Mines Cyclone separator. Another Hanna operation utilizing a means of recovering intermediate grade ores is at the Mesabi Chief mine, near Keewatin. Last year saw the start of construction of an HMS plant with a rated capacity of 400 tons per hour.

Cleveland-Cliffs Mining Company at its Holman-Cliffs mine is conducting an experimental fine ore treating plant that will include a Hardinge drum separator in an HMS circuit to treat minus-¾-inch material. Both HMS and washing will be incorporated in a new mill being erected at Cleveland-Cliffs Hockings mine. This plant also will be ready for commercial operation in 1952.

Production of Copper and Iron Ore in Michigan from 1941 Through 1951

Year	Copper	Iron Ore*
1941	46,440	15,201,619
1942	45,679	16,129,474
1943	46,764	14,510,357
1944	42,421	15,425,788
1945	30,401	11,865,624
1946	21,663	8,756,802
1947	24,184	12,965,482
1948	27,777	12,896,478
1949	19,506	11,199,024
1950	25,608	12,691,101
1951[1]	24,580	13,520,000

* Gross Tons.
1. Estimated.

Pickands Mather & Company operated five concentrating plants on the Mesabi range during the year 1951. A sixth such plant is now being constructed at the Scranton mine near Hibbing.

Near Eveleth, a mobile mill was erected to treat ores from two mines operated in the district by the Pacific Isle Mining Company and the E. W. Coons Company. A second mobile mill, that of the W. S. Moore Company, operating in conjunction with a HMS plant, was first used at the Prindle mine last year.

More examples could be given of beneficiation plants that first operated in the calendar year 1951 and still more that were commenced, but referring back to the opening sentence of trends on the iron ranges being "thought provoking," it is only necessary to point out why processing plants are being built all through the Lake Superior district. As is well known these, per se, will not increase ore output from the Ranges involved, but rather are being erected solely to up-grade the leaner ores that are and will be encountered from this time forward.

No review of iron mining in the Lake Superior region in 1951 would be complete without mention of the taconite

Electric shovels loaded iron ore into 70-ton standard gauge railroad cars at a record rate in the great open pit mines of the Mesabi Range in 1951. Minnesota led the United States to an all-time high iron ore production during the year.

plant planned at Beaver Bay, to be built for Reserve Mining Company. Present plans call for first operation early in 1956. Manager of Reserve Mining Company is Oglebay-Norton & Company.

On the Michigan ranges as in Minnesota the biggest news is in lean ore beneficiation. The hematite ore of the Marquette range is similar to the taconites of Minnesota insofar as beneficiation is required. To Cleveland-Cliffs go laurels for being the first to construct a HMS plant on the Marquette Range. This plant was completed and had it not been for the early freeze, would have shipped its first concentrate in 1951. As it is, the plant at the Ohio mine, Michigamme, will commence shipments of concentrate early in 1952. This is a simple HMS operation and incorporates Humphreys spirals.

M. A. Hanna Company at the Groveland mine, Randville, is erecting a plant to beneficiate low grade hematite at this old mine which has been inactive for many years.

Two large new underground mines are in the development stage in Michigan: one on the Marquette range and the other on the Menominee range. These two mines, the Bengal-Tully, east of Stambaugh, and the Tracy mine in Negaunee, will not be completed and ready for full scale operation until 1955 and 1954, respectively. The Tracy mine is planned for a capacity of 1,000,000 tons annually; while the Bengal-Tully is expected to produce up to 1,500,000 tons annually. Jones & Laughlin is sinking the Tracy mine shaft and Cleveland-Cliffs is operating Mather mine for the Negaunee Mine Company—jointly owned by Cleveland-Cliffs and Bethlehem Steel Corporation.

Pickands Mather & Company is conducting development work at its Ironton mine, Bessemer. This work includes sinking a new large-capacity shaft. The Berkshire mine, Iron River district, is another mine where the shaft is being enlarged preparatory to hoisting ore from several properties. This same is true of the Tracy mine which will tap three former properties.

A small underground mine, the Cayia, is being opened by Inland Steel Company in Crystal Falls on the Menominee

IRON ORE SHIPMENTS IN GROSS TONS FROM MINNESOTA, MICHIGAN, AND WISCONSIN BY COMPANIES AND MINES FOR 1950 AND 1951

Company	*Mine*	*1950*	*1951*
Charleson Iron Mining Company			
1950 (191,139) 1951 (239,578)			
	Charleson (conc.)	191,139	198,971
	Glen Stockpile		40,607
Cleveland-Cliffs Iron Company			
1950 (7,882,919) 1951 (9,070,935)			
	Athens	608,163	610,590
	Cambria-Jackson	446,652	376,108
	Cliffs-Shaft	587,608	729,991
	Lloyd	184,764	233,144
	Maas	619,828	789,528
	Mather	1,308,584	1,555,766
	Tilden	115,231	88,586
	Lake	21,057	61,475
	Spies-Virgil	257,838	250,123
	Agnew	359,432	323,549
	Alworth	1,405	8,076
	Atkins	403,393	247,206
	Canisteo	678,922	922,285
	Hawkins	591,603	572,041
	Hill-Trumbull	543,408	807,335
	Holman-Cliffs	872,666	958,393
	Sargent	242,536	255,126
	Wanless	39,779	281,613
E. W. Coons Company			
1950 (506,071) 1951 (413,200)			
	Genoa-Sparta (conc.)	107,522	157,841
	Genoa-Sparta	302,555	178,999
	Genoa Mine (conc.)		31,859
	Genoa		36,383
	Julia (conc.)		8,118
M. A. Hanna Company			
1950 (12,115,466) 1951 (13,677,204)			
	Bray	742,493	879,258
	Mesabi Chief	106,532	547,017
	Stein		6,448
	Wabigon	56,553	112,138
	Norpac	31,042	60,764
	Impro B	202,161	554
	Buckeye	681,740	294,659
	Jennison		522,804
	Section 18	495,588	468,994
	Douglas	118,864	64,151
	Duncan	585,397	874,053
	Dunwoody	187,317	14,905
	Argonne	248,430	171,752
	Leach		82,262
	Perry	410,111	338,774
	Harrison	19,430	125,441
	North Harrison	224,654	175,534
	Halobe	493,354	352,868
	Quinn	4,435	4,752
	Hoadley	760	1,924
	Kevin	265,862	241,403
	Olson	307,868	463,632
	Patrick A	401,812	471,152
	Patrick Annex	143,188	12,909
	Patrick B		122,884
	Snyder		35,118
	Galbraith	382,770	585,803
	Wyman	189,040	198,071
	Weggum	167,464	11,850
	Weggum South Longyear	336,015	525,894
	South Agnew	817,349	1,364,162
	Agnew No. 2		359,588
	Alstead	167,952	135,525
	Feigh	508,152	425,128
	Moroco	10,741	95,572
	Mangan Joan	65,114	28,447
	Mangan Stai	102,679	44,221
	Huntington	19,579	28,082
	Louise	60,377	2,298
	Section 6		151,587
	Portsmouth	600,446	492,823
	Rowe		7,738
	Spring Valley	321,671	452,235
	Bengal-Tully	163,682	198,205
	Hiawatha	590,885	583,706
	Homer	501,463	588,949
	Wauseca	591,342	578,476
	Richmond	224,168	251,235
Haley Young Mining Company			
1950 (235,807) 1951 (221,643)			
	Minnewas	92,144	90,511
	Elbern	143,663	131,132
Inland Steel Company			
1950 (1,434,742) 1951 (1,708,608)			
	Morris	307,357	353,645
	Greenwood	86,471	69,695
	Sherwood	414,618	499,619
	Bristol	105,017	192,286
	Armour No. 1	276,461	216,149
	Armour No. 2	244,818	377,214
Inter-State Iron Company			
1950 (3,510,053) 1951 (3,440,018)			
	Hill Annex	751,682	699,843
	Sullivan No. 2	20,536	122,775
	Grant	363,183	483,380
	Longyear	984,586	974,694
	Columbia	789,678	683,614
	Missabe Mountain	691	21,884
	Sauntry	263,784	205,696
	Schley		248,132
Jessie H. Mining Company			
1950 (0) 1951 (149,335)			
	Jessie		149,335
W. S. Moore Company			
1950 (632,105) 1951 (959,771)			
	Margaret direct		10,234
	Prindle	291,566	281,668
	Prindle Stockpile	57,892	13,700
	Missouri Stockpile		13,095
	Judson		100,507
	Hanna	105,132	101,406
	Pilot	18,763	150,767
	Yawkey	60,765	35,323
	Norman		1,609
	Knox Extension		251,462
North Range Mining Company			
1950 (397,357) 1951 (559,548)			
	Blueberry	195,764	208,853
	Champion	125,680	183,910
	Book	75,913	128,111
	Warner		38,674
Oglebay Norton & Company			
1950 (1,535,732) 1951 (1,133,234)			
	Montreal	1,102,828	1,133,234
Oliver Iron Mining Company			
1950 (35,194,541) 1951 (43,992,961)			
	Mountain Iron Group	2,857,474	3,820,002
	Mott	216,545	299,708
	Rouchleau Group	5,127,553	6,034,380
	Auburn Group		902,571
	Spruce U. G.	266,195	247,961
	Spruce O. P.	1,667,298	2,203,825
	Fayal U. G.	162,318	66,463
	Fayal O. P.	533,218	756,264
	Burns		399,042
	Gilbert	2,015,376	2,004,399
	Canton	1,504,042	1,972,404
	Knox Extension		251,462
	Sauntry	364,042	298,403
	Hull Rust Group	5,715,162	5,787,727
	Wyoming		529,943
	Morris Group	403,570	260,379
	Pillsbury	270,624	216,821
	Monroe Group	2,658,719	3,270,497
	Sherman Group	5,819,277	8,556,115
	Godfrey U. G.	611,776	581,847
	Fraser U. G.		77,316
	Midway		297,315
	Kosmerl Stockpile		3,840
	Pillsbury Brown		66,300
	Glen Stockpile		40,607
	Walker Group	1,269,915	1,362,440
	Arcturus Group	459,048	517,013
	Gross Marble Group	1,155,958	1,307,541
	Geneva	641,960	565,147
	Pioneer	690,521	859,997
	Sibley	318,576	239,687
	Soudan	186,102	195,545
Pacific Isle Mining Company			
1950 (354,878) 1951 (372,929)			
	Chieftan lean ore stockpile		11,042
	Cyprus-Rust		73,015
	Dunwoody lean ore stockpile		556
	Kerr—East Lease		15,477
	Kerr—West Lease		8,084
	Lamberton	160,066	31,520
	Leetonia lean ore stockpile		1,405
	Missabe Mountain lean ore stockpile		2,918
	Nordine		19,240
	North Shiras		43,364
	North Uno		325
	Pacific Fee		1,675
	Sheridan		1,613
	Shiras		1,188
	Smith	4,376	8,011
	York	132,772	77,247
	Croxton		41,949
	Other	57,664	
	Gorman		34,300
Pickands Mather & Company			
1950 (12,775,099) 1951 (14,317,634)			
	Erie Preliminary Plant	59,209	130,678
	Embarrass	1,201,503	1,480,733
	Biwabik	252,546	248,490
	Corsica	332,718	382,367
	Wade	396,236	436,665
	Albany	298,218	386,986
	Scranton	1,366,869	950,840
	Mahoning	2,640,657	3,454,649
	Bennett	597,796	614,154
	Danube	530,844	758,204
	Mahnomen	246,885	515,149
	Sagamore	426,825	434,991
	Zenith	455,327	493,778
	Cary	598,791	611,832
	Newport	697,643	617,643
	Anvil-Palms-Keweenaw	546,942	694,810
	Plymouth	317,459	223,027
	Sunday Lake	513,435	460,959
	Volunteer	113,616	134,838
	Davidson	337,969	423,385
	James	179,121	213,832
	Buck Unit	435,687	638,482
Republic Steel Company			
1950 (1,862,242) 1951			
	Susquehanna	888,650	999,267
	St. Paul		302,862
	Stevenson		147,158
	Penokee	566,599	529,253
	Tobin	406,991	293,433
Rhude & Fryberger			
1950 (307,368) 1951 (331,034)			
	Pennington	184,178	221,019
	Troy	106,641	102,906
	Seville	16,551	7,114
Snyder Mining Company			
1950 (852,995) 1951		1,017,224	
	Webb	523,094	615,567
	Virginia	209,618	284,500
	Shenango	120,283	115,210
	Whiteside		1,947
Stanley Mining Company			
1950 (404,835) 1951 (464,820)			
	Mary Ellen (conc.)	404,835	464,820
Zontelli Brothers, Inc.			
1950 (261,726) 1951 (380,315)			
	Virginia	215,212	220,978
	Mangan-Joan		41,669
	Martin	12,485	5,625
	Merritt		33,781
	Ironwood (conc.)		78,262

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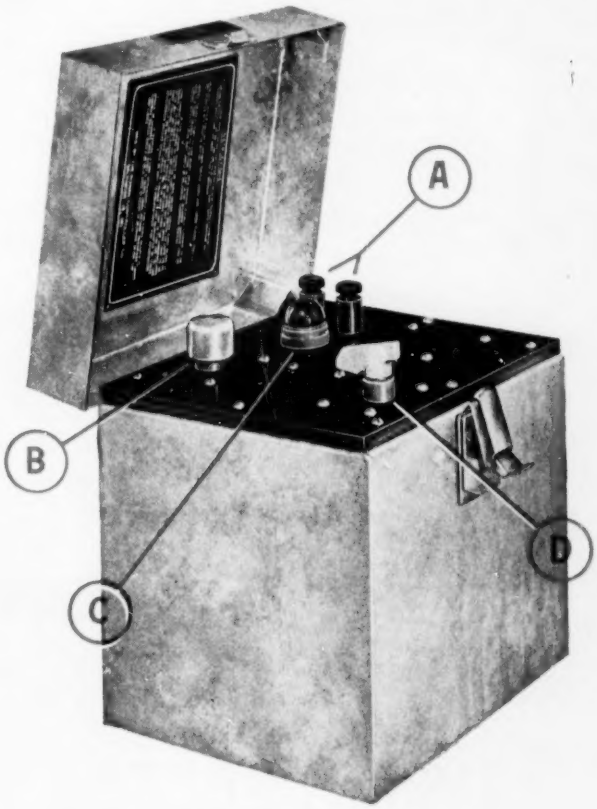
GREATER SAFETY



This latest product of Du Pont Explosives Research is a newly designed, portable, condenser discharge type blasting machine. In two models: CD-45 and CD-30.

Both machines have exceptionally high capacity. The larger (CD-45) is the most powerful built to date. Both machines easily fire small tunnel rounds in straight parallel . . . sizable rounds in straight series . . . and a surprisingly large number of caps in parallel series.

These new machines have been thoroughly tested in various kinds of operations throughout the country and have been found suitable for every conceivable type of blasting job, either on the surface or underground. The number of caps fired is not dependent on the physical effort applied by the operator, and the machines contain no moving parts.

Several built-in safety features provide maximum protection at all times. A group of long-lasting, radio-type B batteries are used to charge a number of condensers. At the moment of firing, these condensers deliver a powerful, instantaneous surge of power to the blasting circuit. The terminals are dead at all times except at the instant of firing and can never be made alive unless the operator has both hands on the controls and really means to fire the shot.

THEY'RE SIMPLE TO USE:

1. Connect wires to terminal posts "A" shown in photo above.
2. Depress charging switch "B" and hold until neon pilot light "C" shines brightly.
3. Still holding charging switch down . . . move firing switch "D" to "on" position. This action fires the charge. *Terminals are energized only at the moment of firing . . .* absolutely removing risk of a premature blast. It's as simple as that!

SPECIFICATIONS

The new Du Pont blasting machine is available in two compact models encased in rugged, waterproof, electroplated metal boxes:

MODELS		CAPACITY straight series primary blast	secondary blast	straight parallel	parallel series
CD-30 (small)	wt. 24½ lbs. length 9½ inches width 9½ inches height 10½ inches	50	125	25	480 (12 series of 40 each)
CD-45 (large)	wt. 31 lbs. length 11 inches width 9½ inches height 11½ inches	50	200	50	1200 (30 series of 40 each)

ASK THE Du Pont Explosives representative in your area for complete information about this new, safer, more dependable, high-capacity blasting machine. E. I. du Pont de Nemours & Co. (Inc.), Explosives Department, Wilmington 98, Delaware.

DU PONT EXPLOSIVES

Blasting Supplies and Accessories

DU PONT

150th Anniversary

BETTER THINGS FOR BETTER LIVING . . . THROUGH CHEMISTRY

GM DIESEL
Case History No. 5011-27

USER: Thomasville Stone and Lime Company, Thomasville, Pennsylvania

INSTALLATION: 3-71 and 6-71 GM Diesels power Joy Heavyweight Champion blast hole drill; 3-71 for rotary and propulsion, 6-71 on compressor and "pulldown."

PERFORMANCE: Replaced 5 small drills. Maximum footage with previous equipment 15 feet per drill in 6¼ hours; with new equipment 180 feet in 6¼ hours. Reduces drilling manpower. Fuel consumption: less than 7 gallons per hour (both engines).

This Diesel replaces five drills

— and more than doubles the footage

Case after case proves that *any* machine with General Motors Diesel power is a *better* machine —gets *more* work done at *lower* cost. Using General Motors 2-cycle design—this Diesel packs more power per pound, runs smoother and accelerates faster. Result—greater production per hour! With most parts interchangeable and easy to replace—GM Diesels take less time out for servicing, cost less to maintain. Check it with other operators—*prove it for yourself* by specifying GM Diesel power in any equipment you buy.

DETROIT DIESEL ENGINE DIVISION
GENERAL MOTORS, DETROIT 28, MICHIGAN
SINGLE ENGINES...Up to 275 H.P. MULTIPLE UNITS...Up to 800 H.P.

It pays to Standardize on

GM GENERAL MOTORS DIESEL POWER

range. Work on this mine was started in 1951 and by December 1st the shaft was down 359 feet. Work was started on the opening of a second mine in the Crystal Falls area: the Lawrence mine, to be operated by Pickands Mather. Ore from the Lawrence, never developed, will be handled through the old Carpenter shaft now being rehabilitated after years of inactivity.

The year 1951, in retrospect, can be thought of as one in which all the iron ranges took off their coats and prepared for the fight ahead. Not only did beneficiation and concentration of lean ores become of major importance, but also many new mines as well as formerly producing mines, were placed in operation. So from the extensive diamond drilling carried on by all major operators, the jet-piercing method of drilling blast holes in open pit operations on down through the block-caving system being currently employed in many underground mines, to the very improvements in ore shipment means, we find the iron ranges fitting themselves for even a greater effort in the 1952 season.

MONTANA

Largest Zinc Producing State; Important Tungsten Finds

Montana displaced Idaho as the nation's leading zinc producing state in 1951. Value of Montana's output of zinc, copper, gold, silver and lead also topped Idaho. For the first time, value of Montana's zinc production exceeded the state's copper output. Manganese development was stimulated by establishment of government receiving depots in Butte and Philipsburg. Uranium and tungsten exploration also was stepped up.

Zinc output increased nearly 25 percent from 1950 to 84,205 tons, valued at $30,145,390. The zinc was worth 10 percent more than Montana's copper production, valued at $27,027,918. Value of Montana's zinc, copper, gold, silver and lead totaled $71,093,107, compared to $54,956,689 in 1950.

Butte mines and dumps of Anaconda Copper Mining Company and manganese-zinc ores from the Emma mine of Butte Copper & Zinc Company provided 94 percent of the state's zinc output. Most of the remainder came from old slag dumps at the East Helena smelter of American Smelting & Refining Company and from that firm's Mike Horse mine.

Anaconda Copper's Butte mines accounted for 99 per cent of Montana's 1951 copper production, 76 percent of its lead, 93 percent of its silver and 50 percent of its gold. The state's copper output was down 2 percent, lead 11 percent, silver 8 percent and gold 44 percent. Two ASARCO operations, the Mike Horse and the Jack Waite, accounted for most of Montana's lead output other than that of Butte Hill. Montana Rainbow Mining Company's Drumlummon mine at Marysville and Acme Company's Gold Coin mine were among the larger independent gold producers.

Anaconda Copper virtually completed preparations for its Greater Butte Project to recover low-grade copper ore by block-caving. It announced plans to go into the aluminum business through construction of a $40,000,000 aluminum ingot plant at Kalispell, utilizing hydroelectric power from the government's new Hungry Horse dam. Harvey Machine Company would have a minority interest.

North Butte Mining Company was granted a $425,000 RFC loan for a precipitation plant designed to recover 500,000 pounds of copper monthly by leaching of mine waters. Mitchell Mining Company started shipments from the old Margaret Ann mine outside Butte. American Alloy Metals, Inc., was formed by Frank Eichelberger, Spokane, Washington, E. J. Cleveland, Reno Nevada and E. A. Julian San Francisco, California

Production of Gold, Silver, Copper, Lead and Zinc in Montana from 1941 Through 1951

Year	Gold Ounces	Silver Ounces	Copper Tons	Lead Tons	Zinc Tons
1941	246,475	12,386,925	128,036	21,259	60,710
1942	146,892	11,188,118	141,194	20,050	54,715
1943	59,586	8,450,370	134,525	16,324	37,606
1944	50,021	7,093,215	118,190	13,105	36,127
1945	44,597	5,942,070	88,506	9,999	17,403
1946	70,507	3,273,140	58,481	8,280	16,770
1947	90,124	6,326,190	57,900	16,108	45,679
1948	73,091	6,930,716	58,252	18,411	59,093
1949	52,274	6,327,025	56,611	17,996	54,195
1950	51,764	6,590,747	54,478	19,617	67,678
1951[1]	28,752	6,054,653	55,613	21,736	84,205

[1] Estimated.

to develop a promising tungsten deposit near Melrose south of Butte A tungsten vein was found in the old Combination silver mine Black Pine mining district northwest of Philipsburg and in the adjoining Betsy Cook property. Trout mining division of American Machine & Metals, Inc., constructed a lead-zinc-silver flotation plant at Philipsburg. Parry C. Yob started reopening the Granite and Bi-Metallic mines near Philipsburg.

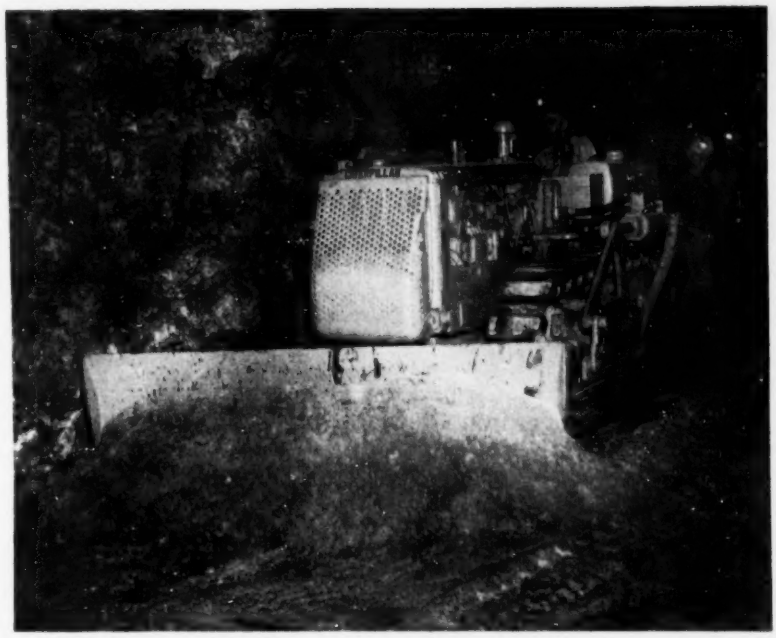
At Silver Bow, west of Butte, Victor Chemical Works put in operation part of the first unit of a $10,000,000 plant to produce elemental phosphorus. Williams Phosphate Corporation started phosphate mining operations near Alder in Madison County. Sierra Talc & Clay Company of Los Angeles took over Mountain Talc Mines in Madison County and planned to mine talc for electronic insulators. U. S. Gold Corporation reported a strike of copper-silver-gold ore in a 2,000-foot lower level adit at its Madison County property and made plans to put its 250-ton mill in operation in 1952 on ore left in upper levels.

Metals Milling Company of Tacoma, Washington, completed a 100-ton custom flotation plant at Basin in Jefferson County. Uranium ore shipments were started from the Haynes mine in Jefferson County's Clancy mining district. Elkhorn Mining Company also shipped some uranium ore. Golden Anchor Mining and Milling Company made progress in reopening the Big Dick and Black Jack mines in Treasure Mountain mining district near Elliston. Kimball Mines, Inc., reported striking milling grade lead-silver-gold-zinc ore in its new creek-level adit at the Kirstead property in the same district.

The western part of Mineral county, adjoining north Idaho's famed Coeur d'Alene mining region, saw considerable claim staking and a revival of interest in long-dormant properties. Nancy Lee Mines, Inc., went into production from its new lower level and the nearby Little Anaconda mine opened some lead-silver-zinc-copper ore. The Green Mountain Mining Company property near Dixon was leased by Kootenay Copper Mines.

In Broadwater County, Swansea Mines, Inc., began development of the Kleinschmidt mine. Sunlight Mining Company mined phosphate rock from its Moonlight property near Maxville, Caledonia Silver-Lead Mining Company of Kellogg, Idaho, developed a dickite clay deposit in Fergus County. Rob Roy Mining Company announced plans to develop its Iron Chancellor prospect east of Lewistown. Alps Mining and Milling Company acquired the Argo tungsten mine adjoining its gold property in Granite County.

Twenty-five exploration contracts were approved by the DMEA in Montana in 1951. They included: Combination mine, Granite County, $70,000, tungsten; Amador Mining Company, Mineral County, $72,190, copper; Star Mine, Neihart, $50,000, lead-zinc; Copper Cliff Mine of Columbia Mining Company, Lewis and Clark County, $24,317, copper; Whitehorse and Emma Mines, Broadwater County, $17,940, lead-zinc; Revais Creek prospect, Sanders County, $21,285, copper; American Alloys Metals, Inc., Beaverhead County, $21,994 and $24,968 tungsten; Hughesville Silver-Lead Mining Company, Cascade County, $10,000, lead; Pittsburgh Silver Mining Company, Mineral County, $11,170; Ambassador Mines Corporation, Sanders County, $23,049; Wade Lewis, Boulder, $25,695 and $12,800, uranium; William B. McLure, Granite County, $16,382, tungsten; Florence Company, Cascade County, $20,690, lead-zinc; Bennett Mining Company, Cascade County, $50,000, lead-zinc; Golden Messenger Corporation, Crystal mine, near Basin, $30,938 lead-zinc; Commonwealth Lead Mining Company, Melrose, $50,580; Western Montana Exploration and Development Company, Duran zinc-lead-copper mine, near Hall.



Diesel powered track-laying bulldozers were successfully used for an increasing number of jobs in the underground potash mines at Carlsbad, New Mexico in 1951.

NEW MEXICO

Anaconda Copper Plans Uranium Mine and Mill in Grants Area

New Mexico's mining industry boomed during 1951 with most minerals mined showing percentagewise production gains.

The value of copper, lead, zinc, gold and silver production, soared to a record-breaking total of $54,313,147—almost $17,000,000 more than in 1950.

Excited speculation, year-long, about possible uranium mining and processing was justified after the new year came by word that Anaconda Copper Mining Company will build and operate a uranium processing plant near Grants. A tentative April 1953 operation date goal was set. A purchasing station for uranium-bearing ore was opened at Shiprock in the northwestern part of the state.

Copper production rose 10 percent over 1950 with 73,100 short tons produced.

New Mexico's biggest producer—Kennecott Copper Corporation's Chino open-pit mine at Santa Rita, worked seven days a week throughout the year except for two weeks in late summer when most metal mines in the state were strikebound.

The ore was run through the firm's 22,500-ton mill at Hurley. Dump leaching recovered siliceous fluxing ore and copper precipitates, and these went directly to the company smelter near the mill.

The Banner Mining Company ran its Bonney-Miser's Chest mine near Lordsburg throughout the year. Its 500-ton flotation mill also ran steadily. The Atwood mine, run on sublease by Ira L. Moseley of Lordsburg, shipped copper-gold-silver ore direct to the El Paso (Texas) smelter of the American Smelting & Refining Company. And White & Wright shipped some 8,000 tons of old copper-bearing tailings from the Gillette millsite in the Pinos Altos mining district.

Lead production last year rose 40 per-

Production of Gold, Silver, Copper, Lead and Zinc in New Mexico from 1941 Through 1951

Year	Gold Ounces	Silver Ounces	Copper Tons	Lead Tons	Zinc Tons
1941	27,845	1,328,317	73,478	4,668	37,862
1942	11,961	676,170	80,100	4,608	46,461
1943	5,563	463,583	76,163	5,723	59,524
1944	6,918	535,275	69,730	7,265	50,727
1945	5,604	465,127	56,571	7,662	40,295
1946	4,009	338,000	50,191	4,899	36,103
1947	3,146	515,833	60,205	6,383	44,103
1948	3,414	537,674	74,687	7,653	41,502
1949	3,249	380,855	55,388	4,652	29,346
1950	3,414	338,581	66,300	4,150	29,263
1951[1]	4,200	445,000	73,100	5,800	45,400

[1] Estimated.

cent over 1950 with 5,800 short tons produced and zinc production soared 55 percent over the year before with 45,400 short tons produced.

Biggest producer of lead-zinc was the ASARCO's Groundhog Unit in Grant County. The firm's 650-ton Deming mill handled Groundhog ore plus custom ore from some 40 other mines in New Mexico, Arizona, Mexico, and Texas.

The United States Smelting, Refining & Mining Company's Bayard operation was second biggest producer of lead and third of zinc. The firm worked its Bullfrog, Slate and Princess shafts.

The Kearney group of New Mexico Consolidated Mines Company was fourth biggest zinc producer with the Peru Mining Company's Pewabic operation close behind. Peru ran its 1,000-ton Deming mill to serve its own operation and also custom ores from the Kearney and Oswaldo mines and from several other districts. A development program was launched.

Gold production rose last year 23 percent over 1950 with 4,200 fine ounces produced and silver production slid up 31 percent with 445,000 fine ounces produced. Most of it was by-product from other base-metal ores. Most of the gold was recovered from copper operations in the southwestern part of the state and from other zinc-lead operations.

Potash production continued uninterrupted through the year amid a vast expansion program that saw two new firms ready themselves to enter the field.

Shortly before the year ended the Duval Sulphur & Potash Company—one of the two newcomers—made its first shipment after completing the sinking of two shafts.

The second newcomer—the Southwest Potash Corporation—continued sinking two shafts, reported down some 600 feet near the year's end. The firm had aimed its $7,000,000 operation at a reported late 1952 date.

The International Minerals and Chemical Corporation continued with its $1,500,000 expansion program which includes two new shafts, and a 6,000-foot crosscut from the completed No. 3 shaft to the old No. 1. The new No. 4 shaft then was to be tied into the new No. 3.

The United States Potash Company announced a million-dollar-plus construction program at its Carlsbad refinery.

Perlite continued its boom in New Mexico during the year and saw a new firm ready itself for operations with reports of other groups doing exploration work.

Production was estimated at 6,000 to 7,000 tons a month.

The Great Lakes Carbon Corporation ran its plant in Socorro County, at a record-breaking level. But through the year F. E. Schundler & Co. of Joliet, Ill., and Long Island City, N.Y., set up a plant with a 25-ton hourly capacity in the No Agua Mountains of northern New Mexico, near Antonito, Colo.

John A. Wood, E. P. Chapman, Jr., and Robert E. Anderson, Jr., all of Albuquerque, mapped and evaluated what appeared to be extensive high-grade deposits of perlite in the Jemez Mountains north of Albuquerque. No production date was in sight, however.

The manganese picture remained clouded in New Mexico at the year's end. High hopes stemming from the Federal government's purchasing program of critical materials were dashed near the end of 1951 when it was learned that a processing charge of $12.00 a ton would be levied at the manganese ore-purchasing depot set up by the General Services Administration at Deming.

The defense-boosted fluorspar industry remained in high gear. The Zuni Milling Company, which operates west of Albuquerque, was milling more than 4,000 tons monthly. The General Chemical Division of Allied Chemical and Dye Corporation ran its Deming mill at capacity, with ore coming from its Shrine Mine near Deming and on a custom basis. Some development work was done.

The new Petaca Minerals Corp. stepped into the mica business on lands near the town of Petaca in northern Rio Arriba County, and sought a $500,000 DMA loan. A mill was planned. The Great Western Mining Co. began shipping mica from its new development near Mora in northern New Mexico, where it has a $150,000 mill. Beryl continued to be produced at the Harding Mine in Taos County, owned and operated by Arthur Montgomery of Dixon. Production has been placed at several hundred tons a year. Some bastnasite, a rare earth mineral, was produced by William Heim at his Red Cloud Mine in the Gallinas Mountains near Corona.

NEVADA

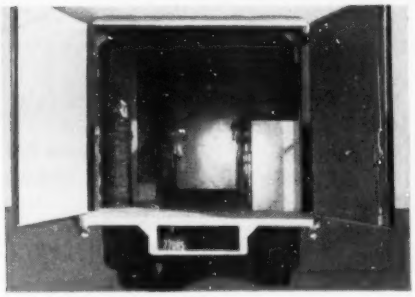
Copper Expansion Projects; Iron Mines Opened in 1951

Copper and iron were the two foremost metals in Nevada's mining industry in 1951. Two copper mine projects were the largest and most important in the state—both tonnagewise and dollarwise. They are the Deep Ruth project of the Nevada Mines Division of the Kennecott Copper Corporation and the Yerington open pit-leaching plant of the Anaconda Copper Mining Company. Kennecott is spending $15,000,000 at its Ruth project to bring a large, deep-seated, low grade extension of its open pit orebody into production.

YOUR ~~OUNCE~~ two tons OF PREVENTION

Pictured here is the new two-ton Boyles Bros. field maintenance truck, completely equipped to handle all major repair items on the job. This outstanding service feature enables Boyles Bros. to inspect equipment in the field to prevent breakdowns before they happen, through inspection and maintenance care. Breakdowns cause loss in time, drilling speed and efficiency, thus increasing costs.

Boyles Bros. has served the mining and contracting industries of the West for over 50 years. Carefully trained personnel, specially designed equipment and experienced know-how enable them to do an outstanding job for exploration, blast hole drilling, tunneling, rock-breaking and grouting.



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Production of Gold, Silver, Copper, Lead and Zinc in Nevada from 1941 Through 1951

Year	Gold Ounces	Silver Ounces	Copper Tons	Lead Tons	Zinc Tons
1941	366,403	5,830,238	78,911	9,623	15,129
1942	295,112	3,723,435	83,663	5,378	10,197
1943	144,442	1,620,280	71,068	4,790	13,647
1944	119,056	1,259,636	61,232	6,605	20,699
1945	92,265	1,043,380	52,595	6,275	21,457
1946	90,680	1,250,651	48,616	7,175	22,649
1947	89,063	1,337,579	49,603	7,161	16,970
1948	111,532	1,790,020	45,242	9,777	20,288
1949	130,399	1,800,209	38,058	10,626	20,443
1950	178,447	1,537,217	52,569	9,408	21,606
1951[1]	123,166	994,244	56,310	7,320	17,210

[1] Estimated.

Anaconda's Yerington project will cost about $33,000,000 and should be in production by the end of 1953 at an annual rate of 30,000 tons of copper.

The greatest number of new mines were all open pit operations producing iron ore for export to Japan. Included among the mines, operators, and locations were: the Stokes mine of the Standard Slag Company at Gabbs; the Modarelli mine of the Simplot Iron Mining Company near Palisade in northern Eureka County; the Buena Vista mine operated by Mineral Materials Company in northern Churchill County; the following mines in the Lovelock area of Pershing County, American mine of the American Ore Company, Segerstrom and Heizer mine operated under contract by the Dodge Construction, Inc., and the Nevada mine operated as the Iron Railroad lease by H. S. Thomas and Roy S. Blair of Lovelock.

Combined Metals Reduction Company was once again the leading producer of lead, zinc and silver from its Pioche mines. It was also increasing mill capacity and adding a HMS unit to recover manganese concentrate as well as base metal concentrate at Pioche. The wholly owned subsidiary, Pioche Manganese Company was erecting a two electric furnace ferromanganese plant at Henderson at a cost of some $3,000,000.

Manganese Inc. continued construction of its $2,500,000 manganese beneficiation plant north of Henderson. The 1,200 ton per day plant will treat low grade manganese ore to be mined from the nearby Three Kids open pit mine.

Placer gold producers were again led by the Round Mountain Gold Dredging Corporation in Nye County. About 12,000 cubic yards of gold bearing gravel was mined and milled at the company's unique open pit-dredge like milling plant. Natomas Company was the second largest placer operator with its connected bucket line dredge on the Greenan placers in Lander County.

There was a wide spread revival of strategic metal mining during the year. The Getchell Mines, Inc. stopped all gold milling and converted its 1,000 ton per day mill to tungsten treatment. Cordero Mining Company was one of the nation's most important quicksilver producers from its Cordero mine in northern Nevada. The Nevada-Massachusetts Company at Tungsten in Pershing County was again the leading tungsten producer. Other tungsten miners included: Kennametal Inc., Mineral County; Black Rock Mining Company, Lincoln County; Tri State Metals Corporation, Clark County; Nevada Tungsten Corporation, Mineral County; Lindsay Mining Company, and Gabbs Exploration Company.

Interest in fluorspar properties was at a high peak during the year with the largest production from the Crowell mine in Nye County and the Baxter mine of Fallon Fluorspar Mines, Inc. in the Broken Hills district of Mineral County.

The combined value of copper, lead, zinc, gold, and silver was $41,241,931 with 55 percent of the value credited to copper output which was up seven percent above 1950. The other four metals all suffered a decrease in output during the year.

In the non metallic field the Basic Refractories Inc. at Gabbs again dominated the brucite and magnesite mining and calcining operations. The firm placed the largest rotary kiln in the world in operation during the year to make granular magnesia refractories. Standard Slag Company operated its Greenstone Extension open pit and Gabbs plant during the year.

Perlite was produced by Combined Metals Reduction Company; talc by the Sierra Talc and Clay Company; diatomite by the Eagle-Picher Company and the

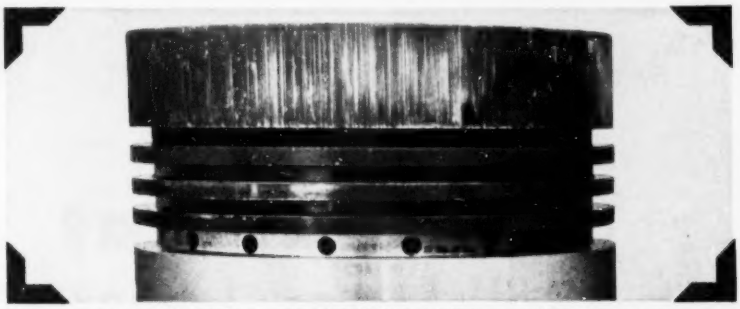
STANDARD ENGINEER'S REPORT

DATA

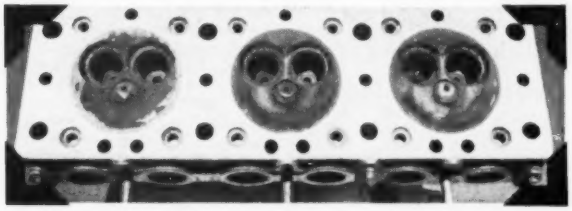
LUBRICANT	RPM Delo Oils
UNIT	Caterpillar D13000 diesel
OPERATION	Operating 75 KW generator
CONDITIONS	Constant speed – varied loads + temp.
PERIOD	2119 hours
FIRM	Lusitania, San Diego, Calif.

Ring-sticking stopped, wear cut in heavy-duty engine

AFTER 2119 HOURS on RPM DELO Supercharged-2 Lubricating Oil, this representative piston from a D13000 Caterpillar indicates the clean condition of lubricated parts of the engine. All 24 rings in the engine were free!

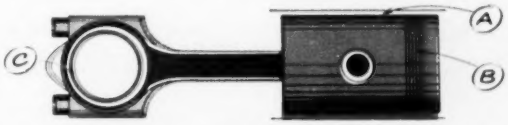


ONLY 0.0002 INCH WEAR PER THOUSAND HOURS was the average wear-rate on cylinders in the engine during the 2119-hour run, although usual drain periods were extended to 1000 hours. Oil temperatures averaged 175° F. to 180° F. Note the open oil-return holes and grooves (above) and lacquer-free piston skirt (left).



CYLINDER HEAD from the engine after the run. RPM DELO Supercharged-2 is recommended specially for heavy-duty engines where fuel-sooting or other deposits, high temperatures or other conditions cause operational problems and wear.

How RPM DELO Oils keep engines clean and prevent wear



A. Contain special additives that provide metal-adhesion qualities...keep oil on parts whether they are hot or cold, running or idle.

B. Anti-oxident resists deterioration of oil and formation of lacquer...prevents ring-sticking. Detergent keeps parts clean, helps prevent scuffing.

C. Special compounds stop corrosion of any bearing metal, and oil foaming in both wet and dry sump engines.

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STANDARD TECHNICAL SERVICE checked this product performance. For expert help on lubrication or fuel problems, call your Standard Fuel and Lubricant Engineer or Representative; or write Standard Oil Company of California, 225 Bush St., San Francisco.

TRADEMARK "RPM DELO" REG. U.S. PAT. OFF.

STANDARD OIL COMPANY OF CALIFORNIA

The Bonanza quicksilver mine resumed operations during 1951. Shown here is the mine surface plant near Sutherlin, Douglas County, Oregon. Part of the large calcines dump in foreground.

Great Lakes Carbon Corporation; and gypsum by the United States Gypsum Company Blue Diamond Corporation, and Pabco Products, Inc.

OREGON

Chrome Mining Again Underway; Bonanza Quicksilver Producing

Value of Oregon's mineral production in 1950 amounted to about $21,500,000 according to an estimate by the U. S. Bureau of Mines. It seems probable that the value for 1951 will not be greatly different. There was some slackening of building construction because of government restrictions and a consequent lessening of production of sand and gravel during the last part of the year. To offset this production, reopening of the Bonanza quicksilver mine and establishment of the government chrome purchasing depot at Grants Pass had an important influence.

Production of gold continued to decline. Two connected bucketline dredges operated in eastern Oregon during the year, one throughout the year and the other about half a year. The dredge in Sumpter Valley operated full time. Porter Brothers finished dredging on Crane Prairie in eastern Grant County and closed down. Reportedly they then had plans to move the dredge to Idaho. Gold production came principally from these dredges and scattered hydraulic operations mainly in southwestern Oregon. Some gold was obtained as a by-product from a few shipments of base metal ore to the Tacoma Copper smelter of the ASARCO. According to a preliminary report issued by the U. S. Bureau of Mines, 8,064 ounces of gold was produced in 1951. This compares with 113,402 ounces produced in 1940 and points to the pernicious anemia from which the gold mining industry is suffering.

The Bonanza mine, the major producer of quicksilver in the state during the war years, resumed production in April and has operated continuously since. Production is at the rate of about six flasks per day. Some encouraging developments underground appear to promise new life for the mine.

The government program for encouraging domestic production of chromite was put into effect on August 3, 1951. A purchasing depot was established at Grants Pass where chrome is purchased in large or small lots. A schedule of prices was established based on standard chrome specifications at $115.00 a ton, which will allow those properties that can produce metallurgical grade to make a profit. Encouragement to production of concentrates from lower grade ore is given in the schedule allowing $110.00 a long ton for concentrates. It is believed that 1952 will see a stepped-up activity in chrome prospecting and mining in southwestern Oregon and northern California. Several new properties will be brought into production and at least half a dozen concentrating mills are planned.

Mine Production of Gold and Silver in Oregon from 1941 Through 1951

Year	Gold Ounces	Silper Ounces
1941	96,565	276,158
1942	46,233	87,376
1943	1,097	10,527
1944	1,369	20,243
1945	4,467	10,461
1946	17,598	6,927
1947	18,979	30,379
1948	14,611	13,596
1949	16,226	12,195
1950	11,058	13,565
1951[1]	8,064	6,010

[1] Estimated.

Production of nonmetallics continued active throughout the year, with the exception noted above in sand and gravel. The two Portland cement companies could not supply all of the local demand and considerable cement was brought in from California and Washington for construction of government dams.

About 50,000 tons of agricultural stone was purchased by the government Production and Marketing Administration for supplying limestone to farmers.

Diatomite was produced at the Great Lakes Carbon Corporation's quarry and plant on the Deschutes River in Deschutes County on about the same scale as for many years past.

Pumice production was somewhat reduced in quantity but new pumice products having a greater unit value were produced so that total dollar value was not much less than in 1950.

Both quartz and granite were produced at one plant for poultry grit and quartz was sold also for metallurgical silica and for special purposes. Harbison-Walker Company entered the local refractories field by purchasing a part interest in the quartz quarry owned by the Bristol Silica Company.

Perlite plaster aggregate was produced by one company at about the same rate as in the preceding year.

Alcoa Mining Company continued to explore ferruginous bauxite deposits in Washington and Columbia counties on a reduced scale.

Hanna Development Company, a subsidiary of the M. A. Hanna Company, did extensive development work on Nickel Mountain in Douglas County. The work included churn drilling, shaft sinking, and bulldozer trenching. The ore consists of disseminated garnierite.

SOUTH DAKOTA

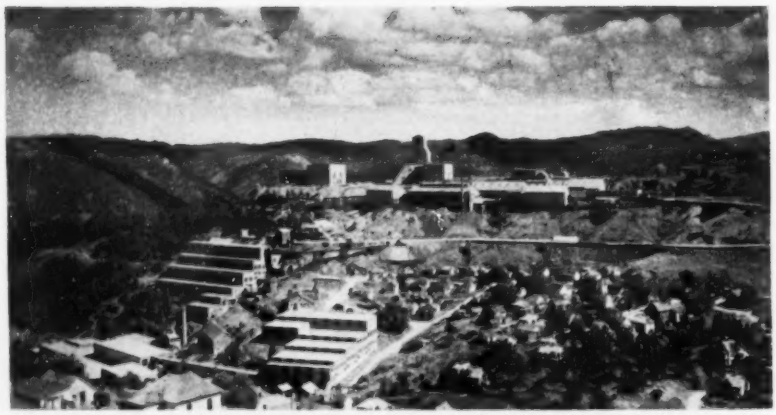
Gold Production Declines; New Spodumene Flotation Plant

The total value of gold and silver produced in South Dakota during 1951 was $16,470,227 as compared with $20,008,436 in 1950. Preliminary figures indicate that approximately 466,918 ounces of gold and 140,780 ounces of silver were produced during the year, or a decrease

of about 18 percent in gold output and 1 percent in silver as compared with 1950. A shortage of miners was the chief reason for the decline in production. The Homestake Mining Company, at Lead, was again the largest producer and operated continuously during the year treating approximately 3,000 tons of ore per day. The Bald Mountain Mining Company, of Trojan also operated continuously during the year, and produced at the rate of about 340 tons per day. Small shipments of bullion or ore were made from the Juniper mine near Keystone and the Silver Queen mine near Lead during the year.

At the Homestake mine the construction of a crushing plant at each of the two principal shafts was in progress at the close of the year. Completion of these plants will allow the company to discontinue the use of stamps now employed as secondary crushers.

Feldspar production for the state in 1951 will probably be somewhat lower than in 1950. Production figures are not available but a shortage of labor developed during the year causing the Consolidated Feldspar Corporation, the major producer in South Dakota, to curtail operations at its two grinding plants located in the Black Hills.



Shortage of labor and higher costs of supplies adversely affected gold output at the Homestake Mining Company's Lead, South Dakota mines and mills in 1951.

Production of Gold, Silver, Bentonite and Feldspar in South Dakota from 1941 Through 1951

Year	Gold Ounces	Silver Ounces	Bentonite Tons	Feldspar*
1941	600,637	170,771	57,139	59,015
1942	522,098	186,937	88,149	64,842
1943	106,444	35,886	124,528	70,913
1944	11,621	5,445	169,893	64,806
1945	55,948	26,564	178,374	68,374
1946	312,247	86,901	186,707	74,540
1947	407,194	111,684	186,450	58,959
1948	377,850	94,693	156,701	54,037
1949	464,650	109,383	137,376	32,272
1950	567,996	142,069	145,000	45,000
1951[1]	466,918	140,780	(2)	(2)

1. Estimated.
2. Not Available.

The bentonite production for South Dakota in 1951 is estimated to be approximately 150,000 tons or about the same as the production in 1950. The Bariod Sales Division of the National Lead Company, the American Colloid Company, and the Eastern Clay Products, Inc., are the principal producers of bentonite in the state and operate processing plants in the Belle Fourche area. None of the operators reported any extended shutdown during the year.

Production of spodumene, the principal lithium mineral produced in South Dakota, was about 7,000 tons in 1951 or approximately the same as for 1950. The Lithium Corporation of America continued to be the largest producer. Its HMS plant located at the Edison mine near Keystone was in continuous operation during the year. To meet the ever growing demands for lithium and lithium compounds the Lithium Corporation of America, subsidiary of the Metalloy Corporation of Minneapolis, Minnesota, started the construction of a 200 ton per day flotation plant for the recovery of spodumene during the year. The plant is expected to go into operation early in 1952 and is located at Hill City. Ore for treatment in the plant was stockpiled at the plant site and came from several mines the corporation is developing in the Hill City-Keystone area.

Interest in the pegmatites of the Black Hills was aroused during the year by the increasing demands of the national defense program for the critical minerals beryl muscovite, tantalite, and columbite. This interest was fostered to a large extent by the mineral exploration program which was inaugurated by the DMA under the Defense Production Act of 1950 and is now being continued and expanded by the DMEA. Under this program 11 projects were approved for South Dakota during the year, 10 of which involved exploration for beryl and mica and one for tantalite and columbite.

Hundreds of uranium prospectors and miners were busy in Grand, San Juan, Garfield, Juab, Wayne, and Emery counties, Utah in 1951. Nearly all the ore was trucked to mills; much of it over mine roads of the type shown in the picture.

UTAH

More Base Metal Mines; Iron And Uranium Activity High

Higher base metal prices and government exploration aid boosted the number of producing lead-zinc-silver-gold-copper mines in Utah from 44 to 57 during 1951. These mines shipped four percent more silver, 15 percent more lead, and nine percent more zinc than in 1950. Copper output was down two percent and gold five percent. The Bingham open pit copper mine of the Kennecott Copper Corporation was once again the largest United States copper mine. A labor strike of five days at the mine resulted in a loss of 9,000,000 pounds of copper output during the year. During its first complete year of operation the new Garfield electrolytic copper refinery of Kennecott produced about 135,000 short tons of copper. Shipments of refined bars of gold and silver were started from the refinery during the year.

The United States and Lark mines of the United States Smelting, Refining and Mining Company were again the largest lead producers. Output was 13 percent larger than 1950 despite the loss of 13 working days by strikes. The mines were also the largest zinc producers and upped output by 18 percent during the year.

Increases in output were credited to

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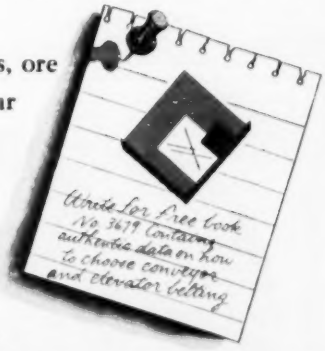

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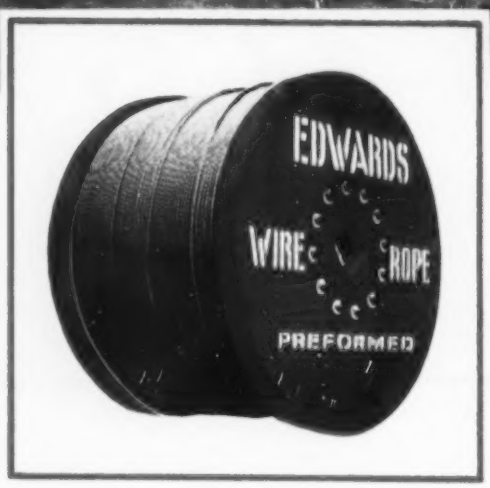

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the major mines in the Park City district with the New Park Mining Company leading the way. New Park, Silver King Coalition Mines Company, and Park Utah Consolidated Mines Company all began major exploration and development programs during the year. New Park added new equipment and streamlined mining operations to produce the largest tonnage of ore in one year in the mine's history. The company also entered into a contract with the Filtrol Corporation for exploration and development of halloysite in the upper levels of the New Park mine.

Uranium prospecting and mining reached a new peak during the year with 150 shippers to mills and ore buying stations in Salt Lake City, Monticello, Marysvale and Thompsons. Many new ore bodies were discovered during the year in the Shinarump Conglomerate in the Green and Colorado River drainage areas of western and south central Utah. The Vitrol Chemical Company converted the World War II Kalunite plant in Salt Lake City to a custom uranium plant and treated ore from Marysvale and the Green River districts. Uranium mining in the "carnotite" districts of Grand and San Juan counties was added by an extensive prospect drilling campaign of the AEC. Shippers of uranium ore in the Henry Mountains and other remote areas were cheered by an announcement that a $1,220,000 access road program was underway to speed delivery of uranium ores to mills.

Exploration projects partially financed by the DMEA were awarded to 12 zinc-lead mines calling for an expenditure of $1,753,191.20. One tungsten project for $12,379.00 and one uranium project in the amount of $18,944.00 were also approved. One of the largest and most important of the government-industry contracts enabled the Chief Consolidated Mining Company to install a new pumping plant at its Eureka mines. Mining of ore at deeper levels was made possible by the plant.

Production of iron ore in Iron County reached a record high of about 4,700,000 gross tons. Most of the ore was shipped to the Geneva plant of the United States Steel Corporation, but a large tonnage was also shipped to the Pueblo, Colorado plant of the Colorado Fuel & Iron Corporation.

Washington's No. 1 zinc producer in 1951 was the Grandview mine and mill operation of American Zinc, Lead and Smelting Company in the Metaline district northeast of Spokane. Only the top of the 765-ton mill shows. The town of Metaline Falls is in the background. The mine, owned by Grandview Mines, Inc., of Spokane, is operated by American Zinc on a 50-50 profit-sharing basis.

WASHINGTON

All Time High Zinc Production And Staking of Claims in 1951

A record zinc production and the biggest Stevens County mining boom since early days highlighted Washington's mining industry in 1951.

Zinc output, up 29 percent over 1950, nearly made up for decreases in production of lead, copper, silver and gold. Although total tonnage of these five metals was down nearly 1 percent to 1,269,673 tons, their value was a record $14,326,562, compared to $12,652,302 in 1950.

Leading zinc producers, in order of output, were the Grandview mine operation of American Zinc, Lead and Smelting Company in Stevens county, Pend Oreille Mines & Metals Company, Pend Oreille county, and the Deep Creek and Anderson mines of Goldfield Consolidated Mines Company in Stevens county. Goldfield upped production 155 per cent, Pend Oreille 46 percent and Grandview 8 percent.

The Pend Oreille mine ranked first in lead production, followed by Grandview, the Bonanza mine of Anaconda Copper Mining Company in Stevens County and the Deep Creek and Anderson mines. These five yielded 98 percent of the state's lead. Total output was down 23 percent from 1950.

The Knob Hill mine in Ferry county remained the largest producer of silver, followed by Howe Sound Company's Holden mine and Anaconda's Gold King mine, both in Chelan County, and the Bonanza mine. Silver output dropped 7 percent.

The Holden mine remained the state's leading copper producer. The Alder Gold-Copper company property in Okanogan County ranked second. Total copper output declined about 17 percent.

A 25 percent drop in gold output was due mainly to smaller production from the Holden, Golden King and Knob Hill mines. The Golden King pushed the Holden out of first place. Knob Hill ranked second, Holden third and Alder Gold-copper fourth.

Stevens County led in new mining activity. Scouts from a half dozen of the nation's biggest mining firms prowled the area. Anaconda Copper Mining Company paid $500,000 to Earle B. Gibbs of Colville and Ira M. Hunley of Spokane on a $2,000,000 purchase option on their Bonanza Lead mine. American Smelting & Refining Company started construction of a 1,000-ton per day zinc-lead concentrator at its Van Stone property.

There was a scramble for mineral rights. Grandview Mines, whose Pend Oreille County property is operated by American Zinc, Lead and Smelting Company, brought its Stevens County holdings of mineral rights to 9,000 acres. Goldfield Consolidated added to its holdings and started exploring its Sierra Zinc mine. Chugston Creek Mining Company purchased the, adjoining, old Chloride Queen mine northeast of Colville. The old Cleveland mine west of Springdale was leased by Spokane-Idaho Mining Company and good ore reportedly was found by downhole diamond drilling.

Two new Stevens County mines went into production in 1951. Pioneer Mining Company started open pit mining of 60 to 70 tons of silver-lead-zinc ore daily from its Longshot claim in the Old Dominion mining district. The Scandia mine in the Northport district yielded zinc ore to Raleigh Hallenius and Theodore Nasburg of Spokane. Germania Consolidated Mines, Inc., shipped its first postwar tungsten concentrates and announced plans to build a new mill. Silver Trail Mining Company's old Dead Medicine mine yielded zinc-cadmium ore to lessees. E. J. Mullen shipped a little lead-gold-silver-zinc ore to Trail, B.C., from his mine six miles east of Chewelah. A new firm, Chewelah Copper Company, started

Production of Gold, Silver, Copper, Lead and Zinc in Utah from 1941 Through 1951

Year	Gold Ounces	Silver Ounces	Copper Tons	Lead Tons	Zinc Tons
1941	356,501	11,395,485	266,838	69,601	42,049
1942	391,544	10,574,955	306,691	71,930	45,543
1943	390,470	9,479,340	323,989	65,257	46,896
1944	344,223	7,593,075	282,575	52,519	38,994
1945	279,979	6,166,545	226,376	40,817	33,630
1946	178,533	4,118,453	114,284	30,711	28,292
1947	421,662	7,780,032	266,533	49,698	43,673
1948	368,422	8,045,329	227,007	55,950	41,490
1949	314,058	6,724,880	197,245	53,072	40,670
1950	457,551	7,083,808	278,630	44,753	31,678
1951[1]	435,200	7,365,000	273,700	51,300	34,600

[1] Estimated.

Production of Gold, Silver, Copper, Lead and Zinc in Washington from 1941 Through 1951

Year	Gold Ounces	Silver Ounces	Copper Tons	Lead Tons	Zinc Tons
1941	84,176	402,030	8,686	3,903	14,320
1942	75,396	369,038	8,030	4,851	14,398
1943	65,244	370,440	7,365	5,022	12,203
1944	47,277	321,608	6,164	5,825	11,904
1945	57,860	281,444	5,281	3,802	11,693
1946	51,168	264,453	4,527	2,987	11,329
1947	34,965	293,736	2,240	5,359	13,800
1948	70,075	375,831	5,665	7,147	12,638
1949	71,994	357,853	5,275	6,417	10,740
1950	62,117	363,566	5,057	10,334	14,807
1951	69,043	339,054	4,175	7,956	19,143

[1] Estimated.

reopening the old United Copper mine. Earle B. Gibbs made a strike of silver-lead-zinc ore at the Old Dominion mine. Mines Management, Inc., of Spokane got the Northwest's first DMA loan—$12,000 for diamond drilling its Iroquois zinc-lead deposit—and built a 50-ton pilot mill at Northport to process ore from its Advance mine. Addy Mining Company entered into a $21,290 tungsten exploration project with the government.

In Pend Oreille County, American Zinc brought its Lead Hill property into production, acquired the adjoining Bluebird group and started extensive diamond drilling of its holdings adjoining the Grandview mine. Pend Oreille Mines put the second 800-ton unit of its new mill into operation and completed a 50-unit, low-cost rental housing project at Metaline Falls. Day Mines, Inc., of Wallace, Idaho, and a new firm, Pacnor Mines, Inc., staked large holdings in the Russian creek sector. Development work by Sullivan Mining Company at the Metaline Contact mine near Metaline Falls indicated a new Pend Oreille county producer in the making. Zinc-lead ore was opened on three levels and 3,500 tons of development ore milled. Columbia Lead & Zinc Company reported promising results from diamond drilling. Newport Mining and Leasing Company started reopening the Hoover lead-silver mine. Grandview Mines and Metaline Mining & Leasing Company undertook joint exploration of two groups of claims in the Slate creek area at year's end.

In Okanogan County, Alder Gold-Copper stepped up production to more than 200 tons daily as the year ended and prepared to start making zinc concentrates. John Russell and George M. Gibson of Twisp leased the nearby Red Shirt mine and said they would also develop the TV mine on Alder creek and the Chicamun on McClure mountain. GOP Antimony, Inc., started producing antimony concentrates at Omak, from ore mined at the Lucky Knock, Bales and Queen mines. Lessees stockpiled some silver-gold-lead-copper-zinc ore from Sunny Peak Mining Company's old Mohawk mine near Conconully.

In Chelan County, Anaconda Copper did exploration work at E. H. Lovitt Company's Golden King mine at Wenatchee's city limits and the adjoining Keegan property under lease and purchase options. Work at the Golden King was done below areas being operated by the Lovitt firm. Gold Bond Mining Company completed a 2,000-foot aerial tramway and enlarged milling facilities. Horseshoe Basin Mining and Development Company began exploring a gold-copper-silver-lead property at the head of Lake Chelan.

In Kittitas County, Cascade Gold Mining and Milling Company took over the old Durrwachter mine and started reopening old workings.

Magnesium production was resumed for the first time since World War II at the $20,000,000 government-owned Mead magnesium plant at Spokane, following a $2,500,000 modernization program. The operating firm, Pacific Northwest Alloys, also started quarrying dolomite at the government pit at Marble, Stevens county. Also at Spokane, Kaiser Aluminum and Chemical corporation added an eighth potline at its Mead aluminum reduction plant and started construction of a cryolite recovery plant.

Thirteen Washington exploration contracts totaling $221,676 were approved by the DMEA in 1951.

WYOMING

Mining of Chemical Making Minerals of Great Importance

Biggest development of the year was the progress Westvaco, now Intermoun-

tain Chemical Company, is making on expansion of its operations near Green River, Wyoming.

Intermountain Chemical Company is constructing a $20,000,000 plant and increasing mine facilities which by 1953 will make the company an even more important factor in the nation's soda ash production. Design capacity will equal 300,000 tons annually, approximately six percent of United States output.

Source of soda ash is trona, the double carbonate and bicarbonate of sodium, which is mined underground at a depth of 1,500 feet; in the present operation calcination of the trona converts it to soda ash. New facilities include a refining process for the production of pure soda ash. A second shaft is being sunk to the deposit and when completed, this new shaft will greatly facilitate mining operations and supply the tonnage requirements for the expanded operation.

The new plant is scheduled to be completed by early 1953, and it will employ nearly 400 workers for the combined mining and refining operations. The plant will generate its own power and steam, bringing water from the Green River, nine miles away, and natural gas from Wyoming gas fields through a new 22-mile pipe line.

The trona occurs as a bedded deposit underlying an area of 30 square miles. Proven reserves total at least 250,000,000 tons—enough to supply the United States for at least 35 years at present rate of consumption.

Wyoming-Gulf Sulphur Corporation has completed construction of a mill for the extraction of sulfur from its 1,760 acre holdings in the Cedar Mountain area near the plant, west of Cody. During the past year, 180 test holes with a total depth of over 10,000 feet were drilled. Although the holes drilled cover only a fraction of the known sulfur deposits, they already have established ample reserves for future production.

The sulfur is found disseminated through siliceous gangue and also as crystallized masses throughout crevices and fractures in the host rock, underlying a travertine or geyserite capping. Areas of concentration are dome or cone like in character. One of the largest cones uncovered, to date, underlies an area 150 feet wide by 800 feet long and extends to 70 feet in depth. This single deposit is estimated to contain 1,000,000 tons of ore. After stripping overburden, which varies from one foot thick to 14 feet in depth, holes are drilled on four foot centers and the sulfur bearing formation is broken up by shooting, following which the ore is loaded and transported by truck to the mill.

Plant capacity is 120 tons of ore averaging 30 percent sulfur per day or 35 tons of finished concentrate, crude sulfur, of 85 to 90 percent grade.

Ore trucked to the plant is stored in a 150 ton coarse ore bin at the highest level at the plant, from which it feeds by gravity through the mill. Primary crushing is followed by roll crushing from which the ore passing a ½ inch screen is fed to a 6 by 4 foot ball mill, employing porcelain balls as grinding media. Fine grinding is not necessary, and the minus-28-mesh product is conveyed direct to flotation, while the ball mill oversize is rejected and passes to waste. Four "Sub A" 18-inch flotation cells are employed as roughers, followed by four cells in pairs as cleaners. Sulfur concentrates from flotation are dewatered in a 25 foot thickener. Water temperature is the thickener is held at 160° F. After thickening, the sulfur concentrate is filtered on a continuous filter and finally melted to form a solid cake.

Production of a 99.5 percent sulfur product is possible through an additional process step. However, present product will be the 85 to 90 percent grade and current plans call for doubling plant capacity in the near future.

Plant production and mining operations are under the management of W. H. Marquette, presdent of the company and the company office is located at the plant.

Bentonite production in 1951 continued as an important mining and processing industry in the state. Principal production of swelling bentonite, as formerly, was from the Black Hills area. The Benton Clay Products Company at Casper placed on the market a quality bentonite for the foundry industry, and expanded its operations by acquisition of the Powder River Bentonite Company.

The Consolidated Feldspar Company, Incorporated mined and stockpiled approximately 1,000 tons of feldspar from its holdings on Casper Mountain. The Wyoming Uranium Company with an office at Lusk shipped to Salt Lake City several cars of ore from the dump of the old Silver Cliff mine at Lusk. Plans are reported to include reopening of the old mine workings if mill tests on the ore shipments are favorable.

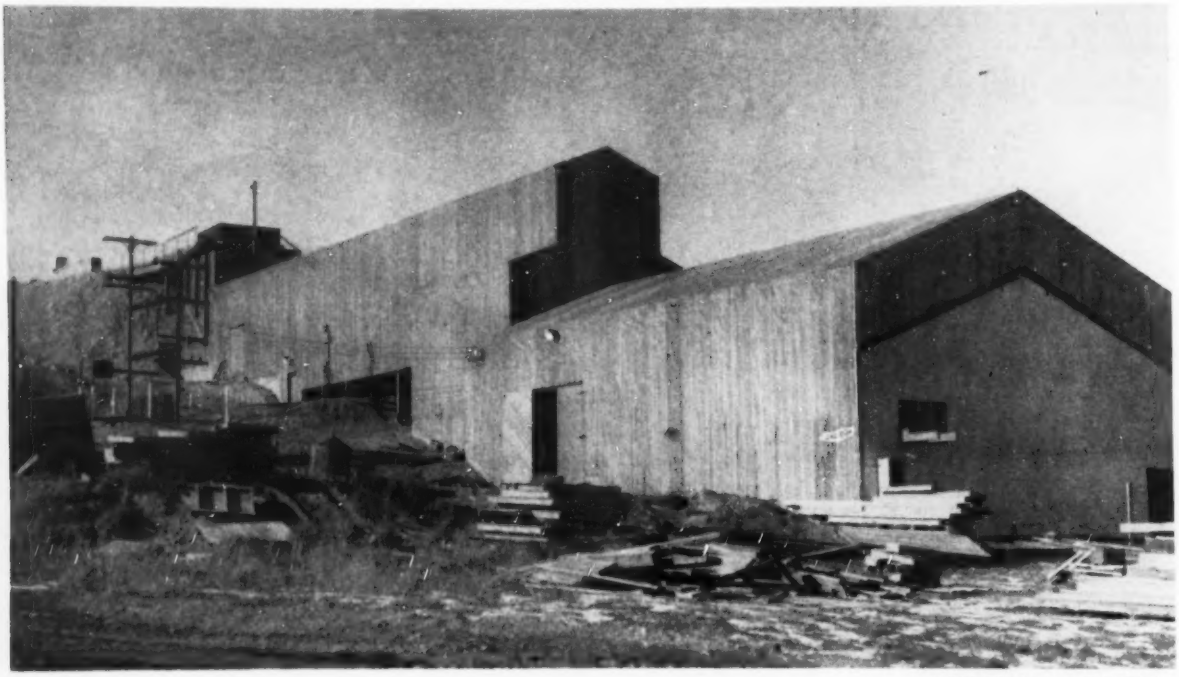
The U. S. Bureau of Mines has received an appropriation of $350,000 for completion of the Laramie Alumina Plant and has requested an additional appropriation of $1,000,000 for operation of the plant. The work planned will determine whether production of alumina from anorthosite, which occurs in a vast deposit in the Laramie Mountains, a few miles north and east of Laramie, would be economic.

Production of Bentonite, Feldspar and Iron Ore in Wyoming from 1941 Through 1951

Year	Bentonite Tons	Feldspar* Tons	Iron Ore Gross Tons
1941	145,574	11,846	985,852
1942	139,410	13,953	957,027
1943	159,252	.....	814,203
1944	196,138	22,415	713,759
1945	199,293	17,021	606,005
1946	212,530	20,345	619,317
1947	259,084	18,801	651,471
1948	383,815	16,760	689,591
1949	350,644	.....	539,554
1950	375,000	.....	491,906
1951[1]	460,000	.....	610,000

* Crude sold or used (Long Tons).
1. Estimated.

The Wyoming-Gulf Sulphur Corporation built and placed in operation this 100-ton per day sulphur flotation mill during 1951 near Cody.



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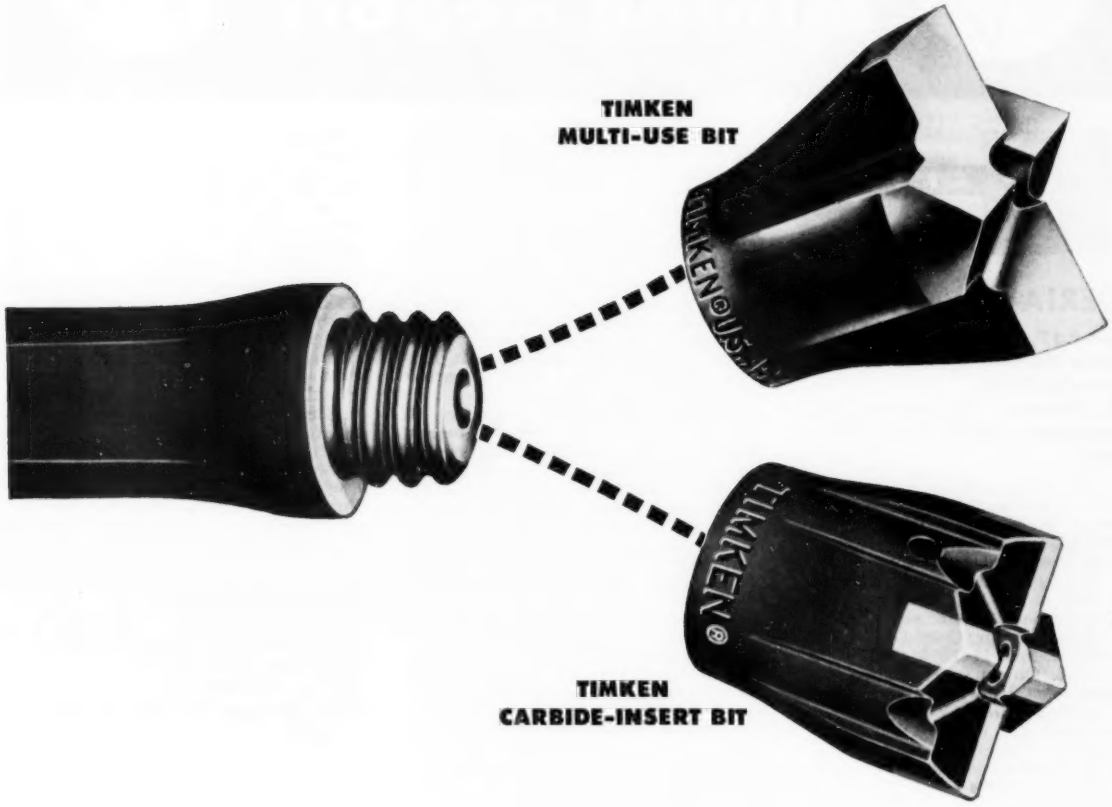

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World-Wide Mining Report

ALGERIA

Area—847,818 square miles
Currency Unit—Algerian Franc
Value—$0.0022
Chief Mineral Products—Iron, phosphate, lead, zinc, antimony.

Iron ore production in Algeria continued to expand during 1951; 2,783,000 tons were produced, compared with 2,572,800 tons in the previous year. All of the ore is exported. Shipments in 1951 totaled 2,765,000 tons, and 2,565,900 tons in 1950.

Calcium phosphate took second place in mining production. Output increased from 677,100 tons in 1950 to 758,000 tons in 1951. Orders from England for metallurgic phosphate presented a market for the mines of M'Zaita. In 1951, the Compagnie des Phosphates de Constantine shipped 714,800 tons.

Lead production increased from 2,350 tons in 1950 to 4,000 tons in 1951; production of sphalerite from 1,530 tons to 5,100 tons; and the production of calamine (zinc) from 15,400 tons to 16,500 tons. Antimony production has remained at about the same level for the last three years—4,420 tons in 1951.

Output of (smectic) clay increased from 47,680 tons to 90,600 tons; barite from 19,890 to 36,800 tons; and diatomite from 13,710 to 23,000 tons.

BELGIAN CONGO

Area—905,516 square miles
Currency Unit—Belgian Franc
Value—$0.0198
Chief Mineral Products—Uranium, copper, cobalt, tin, diamonds, zinc, gold, manganese.

The production of nearly all minerals increased in 1951. The copper output reached 188,000 metric tons against 176,000 in 1950; this is due to the increased hydroelectric power available during the year.

The by-products of the Union Minière du Haut Katanga's copper mines have grown accordingly: the zinc concentrate output reached 168,000 metric tons compared to 146,000 in 1950 and cobalt production attained 5,500 tons against 4,900 in 1950. The uranium production is still kept secret.

The production of cassiterite (averageing 73 percent tin) has attained 15,200 tons for the Congo and 2,600 tons for the Mandated Territory of Ruanda-Urundi, making a total of 17,800 tons against 18,000 tons the previous year. This production could have been greater but for a setback at Géomines where heavy floods curtailed the production for several weeks. The other companies are increasing their production. As previously announced, Géomines is now treating its hard rock pegmatites and is planning the erection of a plant to extract lithium from spodumene.

Wolframite reached a production of 118 tons in the Congo and 250 tons in Ruanda-Urundi, making a total of 368 tons against 180 tons the year before and the mixed cassiterite-wolframite ore output was 420 tons against 455 in 1950.

The production of tantalite-columbite receded from 127 tons to 73 tons but the production of mixed cassiterite-tantalite-columbite was 1,180 tons against 1,073 tons.

Fine gold production increased from 10,321 kgs in 1950 to 11,000 kgs to which must be added 200 kgs from Ruanda-Urundi. The gold mining industry has been slightly encouraged by the sale of gold on the free market but the official price is undoubtedly still too low to make it an interesting mining enterprise.

The output of industrial diamonds attained 10,044,000 carats against 9,604,000 in 1950 and the production of jewelry stones was practically unchanged at 544,000 carats.

As forecast the production of manganese has reached 38,000 tons (metallic content) against 8,500 tons in 1950 and further developments are expected.

FRENCH EQUATORIAL AFRICA

Area—912,049 square miles
Currency unit—Franc
Value—$0.025
Chief Mineral Products—Diamonds, gold, lead, zinc.

The only improvement observed in the development of the mining industry in French Equatorial Africa in 1951 was in diamond mining, extraction totaling 142,000 carats, compared with 111,500 in 1950. A total of 200,000 carats is expected to be produced in 1952. The production increase is attributed to more prospecting, and to better mechanical equipment at many of the mines. The ECA has provided funds for the Compagnie Miniere de l'Oubangui Oriental, its branch the Societe de Recherches et d'Exploitation Diamantifere, and the Societe Miniere Intercoloniale. Eventual repayment will be made by diamond shipments to the United States government.

Gold production remained more or less stationary at 1,700 kilograms.

The Miniere du Congo Francaise produced 5,400 tons of lead concentrates and 1,500 tons of zinc concentrate from its M'Fouati deposit in the Middle Congo, a tonnage about equal to that of 1950.

Surveys are under way to find new manganese and columbite-tantalum deposits. Manganese deposits are known to exist at Gabon, but their development would be justified only if tonnage exists in large quantities because they are so far from the coast. Mining for columbite and tantalite had to be abandoned because of high transportation costs to the coast. The Pechiney Company and the Bureau Minier de la France d'Outre Mer are seeking new veins which could be mined under better conditions.

CAMEROUN

Area—81,000 square miles
Currency Unit—Franc
Value—$0.00785
Chief Mineral Products—Tin, gold.

There was little mining activity in Cameroun during 1951; 180 kilograms of gold, 96 tons of cassiterite, and 100 tons of rutile were produced, as compared with 220 kilograms, 96 tons and 25 tons, respectively, in 1950.

The Societe des Etains du Cameroun is now moving its equipment from the tin-bearing placers which are now exhausted to the residual tin-bearing deposits which will be mined and processed.

FRENCH MOROCCO

Area—200,000 square miles
Currency Unit—Franc
Value—$0.025
Chief Mineral Products—Manganese, cobalt, phosphate, lead, zinc.

The development of the mining industry in French Morocco showed a remarkable gain in 1951. The production of phosphate increased 22 percent; the production of lead, zinc, iron, and cobalt, respectively, 41, 60, 66, and 93 percent. For the first time, the Empire of the Shereef produced refined lead (18,400 tons).

The mining of lead-zinc ore is becoming of greater importance. 93,200 tons of lead concentrate were produced in 1951 (66,000 tons in 1950), and 36,500 tons of zinc concentrate (23,000 in 1950).

From the deposit of Bou Beker, belonging to the Societe Nouvelle des Mines de Zellidja (a Newmont Mining Corporation affiliate), the production was 38,800 tons of lead, and 30,100 tons of zinc. Societe des Mines d'Aouli has doubled production in four years and produced 22,100 tons of lead concentrate from its deposits at d'Aouli and at Mibladen; the Compagnie Royale Asturienne des Mines at Touissit produced 17,700 tons. The Societe Nouvelle des Mines de Zellidja installed a smelter at Oued-el-Heimer where 18,400 tons of pig lead were produced in 1951.

Manganese production rose from 257,800 tons in 1950 to 334,170 tons in 1951, a 30 percent gain. The most important producing companies were Imini (156,220 tons), Bou-Arfa (62,950 tons), and Tiouine (57,330 tons). Numerous operations were begun, but as yet they only furnish a few thousand tons each annually. Two societies have processed part of their ore cooperatively: the Societe Cherifienne d'Etudes Minieres thus produced 121,700 tons of sinter in its plant at Sidi-Marouf, while the Societe des Mines de Bou-Arfa obtained 15,100 tons of sinter from the same plant. In 1951, 177,180 tons of ore and 135,000 tons of sinter were exported—almost entirely to France. Only 10,850 of ore and 12,660 tons of sinter were sent to the United States. Chemical-grade manganese was mined by the Societe Cherifienne d'Etudes Minieres from its ore body at Imini (37,400 tons) and by the Societe des Mines de Bou-Arfa (600 tons). Exports amounted to 39,300 tons, of which 17,600 tons went to France, 10,670 to the U.S., and 6,330 to Germany.

An agreement was made between the U.S. government and the Societe Miniere de Bou-Azzer et du Graara (Bou-Azzar and Graara Mining Company) to increase production of cobalt and asbestos. In 1951, the company's production was 6,750 tons of cobalt ore and 600 tons containing asbestos, against 3,510 tons and 510 tons in 1950. France imported 3,940 tons of cobalt ore and Canada 2,740 tons.

Different percentages of uranium in the deposits of phosphate in Morocco and veins of pitchblende were discovered near Azegour in the district of Bou-Azzer.

FRENCH WEST AFRICA

Area—1,814,810 square miles
Currency Unit—Franc
Value—$0.0058
Chief Mineral Products—Bauxite, iron, phosphate.

Prospecting for gold continued in French Guinea (Kato, Banora), on the Ivory Coast, and in Haute Volta (Hire, Akrizi). On the Ivory Coast, the "Saremci" discovered a diamond deposit in the region of Katiola. The total production in 1951 was 117,000 carats, against 135,000 carats in 1950, owing to lower grades of certain Guinean alluvial deposits. The Societe Pechiney anticipates a production of 150,000 tons of calcium phosphate yearly. Part of the mineral is to be treated locally and will be used as an agricultural fertilizer in the area.

The Compagnie des Bauxite du Midi is mining deposits of bauxite on the isles of Los, situated west of Conakry, French Guinea. The objective to produce 300,000 tons yearly will be attained in 1952.

The Compagnie Miniere de Conakry terminated its prospecting work on the peninsula of Kaloum (near Conakry in French Guinea) and started plant construction in July 1950. It will be possible to begin mining at the end of 1952, on the basis of 1,200,000 tons of ore yearly, with the possibility of extending the production to 3,000,000.

Mauritania is the object of rather enterprising investigations which seem to be promising. At Akjoujt, the Syndicat Minier d'Inchiri, constituted by the local government and the Bureau Minier de la France d'Outre Mer, (French Overseas Mining Syndicate), are continuing prospecting a copper deposit. A campaign of deep borings was undertaken to explore the deposit starting in 1947. Borings are also underway at Gaoua (Haute Volta) where indications of the existence of copper ore have long been observed.

Exports and Value in Pounds for Gold Coast Minerals in 1950 and 1951

Commodity	*1950 Quantity*	*£ Value*	*1951 Quantity*	*£ Value*
Gold[1]	705,000	8,719,000	698,676	8,564,000
Manganese[2]	711,000	5,007,000	832,000	7,416,000
Bauxite[2]	115,000	223,000	141,000	247,000
Diamonds[3]	932,000	1,837,000	1,632,000	5,703,000

1. Fine ounces 2. Dry metric tons 3. Carats

GOLD COAST

Area—96,000 square miles
Currency Unit—Pound Sterling
Value—$2.80
Chief Mineral Products—Gold, manganese, diamonds, bauxite.

The gold mining industry made steady progress during 1951 and was considerably helped, financially, by the right to sell 40 percent of the output on the free market. The extra money realized has been useful in offsetting constantly rising costs.

The main shafts of the Ashanti Goldfields Corporation, Ltd.'s mine reached the following depths by September 1951; Main shaft 3,188 feet; Timber shaft 3,196 feet; South shaft 2,770 feet; West shaft 1,690 feet. A sub-vertical shaft is being sunk from Number 31 level and reached a depth of 607 feet below that horizon. A circular ventilation shaft 1,778 feet deep exhausting 250,000 cubic feet of air a minute was completed last year. A new deep shaft, the Eaton Turner shaft, is 18 feet in diameter and is planned to serve the mine, in depth, below 4,200 feet.

During 1951, 235,070 tons of ore was fed to the Pompora treatment plant, which has a capacity of 30,000 tons a month, and yielded 183,215 ounces.

The biggest producer of manganese in the world outside Russia—African Manganese Co., Ltd. at Nsuta—increased output during 1951 in response to a higher world demand.

Ninety percent was excavated by Bucyrus Erie and Ruston Hornsby Diesel excavators and 10 percent by hand during 1951. Four new Bucyrus Diesel shovels were put in service and four Vulcan Diesel locomotives of 130 hp each, and one Diesel 35 hp locomotive. The company hopes to increase production to 900,000 tons during 1952 but, at time of writing in March, it is reported that 860,000 tons may be a more realistic forecast.

Very large bauxite deposits are known to exist in the Gold Coast and 1951 saw important progress towards the creation of an aluminium industry. The consulting engineers, Sir William Halcrow & Partners, have reported favorably on the development of the River Volta basin.

Diamonds mined in the Gold Coast

At Rutongo, Ruanda the Bahutu tribesmen dig and load cassiterite bearing gravel which is transported to washing plants in the two ton rocker bottom cars.

Tonnages of Gold and Manganese Ore Mined, Manganese Ore Washed, and Ounces Gold and Tons of Manganese in 1950 and 1951

ITEM	*1950*	*1951*
Gold ore mined	2,367,991	2,482,493
Lode gold recovered	637,438	660,605
Placer gold recovered	49,968	38,071
Total gold produced	687,406	698,676
Manganese ore and waste mined	2,058,000	1,993,000
Manganese ore washed	1,035,883	1,188,506
Manganese ore and concentrate produced	766,325	839,995

are mainly of the industrial type. They are produced one-half by the big companies, principally, Consolidated African Selection Trust and one-half by the native workers. The latter's operations, though wasteful are largely responsible for the remarkable rise in the quantity, and value, of the diamond exports.

MADAGASCAR

Area—228,707 square miles
Currency Unit—Franc
Value—$0.0058
Chief Mineral Products—Graphite, phlogopite mica, quartz.

There was a marked increase in graphite production during 1951 (18,000 tons, against 14,000 tons in 1950); it took first place among minerals produced and exported from the island during the year. The properties are being progressively modernized with the aid of United States machinery.

The production of phlogopite mica has been steady for the past two years—8,000 tons produced in 1950 and again in 1951. Under an agreement dated August 10, 1951, the United States purchased 500 tons of phlogopite for stockpiling.

The production figures for industrial beryl and industrial garnets were maintained at 350 and 570 tons, respectively, against 486 and 518 tons in 1950. Because of the distinct classifications of Madagascar quartz into optic quartz, oscillator quartz, and quartz for jewel use, the production increases every year (19 tons in 1951, against 15.8 tons in 1950).

A new mineral deposit containing uranium has been found near Antsirabe and a plant is being erected to concentrate the mineral.

NIGERIA

Area—372,674 square miles
Currency Unit—Pound Sterling
Value—$2.80
Chief Mineral Products—Tin, columbite.

Tin mining continued to be first in importance during 1951. The increase in tin production represents something of a triumph for the Amalgamated Tin Mines of Nigeria and the numerous native operators. Late in March 1951, shortage of water in the reservoirs led to drastic reduction in power supplies. Major overhaul of AMT's Dorowa dredge and four large Monighan draglines also slowed production. The hard ground encountered has considerably reduced the yardage treated by gravel pumps but this disadvantage has been overcome by the arrival of £400,000 worth of special Euclid earth moving equipment.

A decrease in production is expected in 1952 as yield of the orebodies fall and the ground becomes more difficult to work.

The increase of the columbite price to 320 shillings a unit raised production to some 900 tons in 1951. Old dumps at tin dressing mills are being combed and new alluvial deposits prospected in an effort to increase production.

NORTHERN RHODESIA

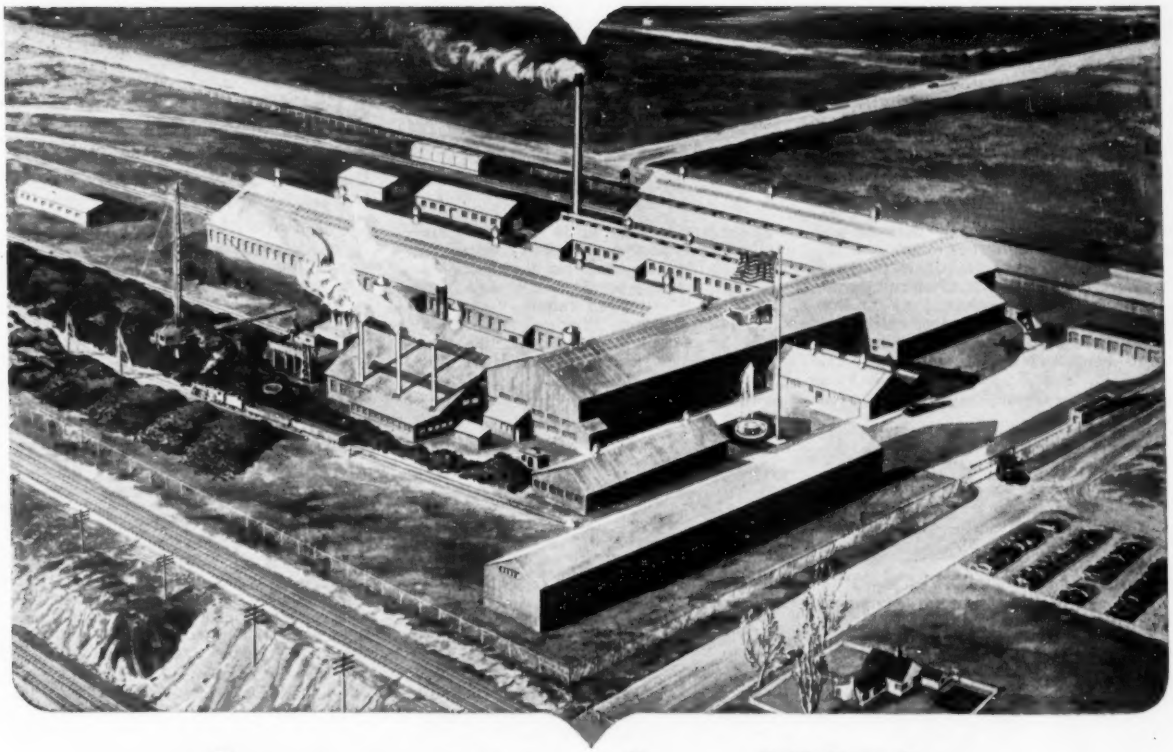
Area—290,320 square miles
Currency Unit—Rhodesian Pound
Value—$2.80
Chief Mineral Products—Copper, zinc, lead, cobalt, vanadium.

Again Northern Rhodesia during 1951 broke all previous records in both production and value of output. The total mineral output, worth slightly more than £71,000,000, exceeds the previous total by £25,000,000, the increase being partly due to increased prices of the various products, but primarily due to increases in production. These increases would possibly have been still greater had it not been for shortages in coal supplies. Coal is at present obtained from the large colliery at Wankie, Southern Rhodesia, which, while having very large reserves, has ever increasing demands in both the Rhodesias for its output of coal and coke. Although coal has been located in several areas in Northern Rhodesia, so far no deposit considered to be economically workable has been located.

The extension to Rhodesia Copper Refineries Ltd. towards the end of 1950 has resulted in a further increase in the production of electrolytic copper to 103,000 long tons. A new Copper Refinery at Mufulira Copper Mines Ltd. is in the process of erection and may be expected to increase this output still further. Blister copper production at 206,000 tons also exceeded the previous year's output. At Nchanga Consolidated Copper Mines,

Tin and Columbite Production and Value in Nigeria in Metric Tons and Pounds for 1950 and 1951

	1950		*1951*	
Commodity	*Tons*	*Value*	*Tons*	*Value*
Tin	11,417	£4,138,000	11,753	£8,975,000
Columbite	1,051	811,000	1,092	839,000



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Ltd. a high-grade mixed oxide and sulphide ore of copper is mined, differential flotation has enabled oxide concentrates suitable for direct leaching to be produced, the sulphide concentrates being smelted at Nkana as previously. The leaching plant to treat these oxide concentrates went into operation during the year and the electrolytic cathodes produced were shipped to Rhodesia Copper Refineries at Nkana for final processing. To provide acid for the leaching and refining operations a sulphuric acid plant, utilizing smelter gases from the Rhokana Corporation, Ltd.'s smelter, was put into operation during the year.

The new electrolytic cobalt plant of Rhokana Corporation, Ltd. was nearing completion and is expected to go into operation early in 1952. At present output is in the form of alloy, containing about 40 percent cobalt and the 1951 production amounted to 1,800 tons of alloy, containing nearly 700 tons of cobalt. It is anticipated that the new process will increase this figure to over 2,000 tons cobalt metal per annum.

Metal Production and Value in Northern Rhodesia in 1951

Metal	*Production*	*£ Value*
Gold[1]	100.7	1,250
Cobalt Alloy[2]	236,726	1,370,551
Copper[3]		
Blister	205,996	40,961,583
Electrolytic	103,146	21,043,257
Lead[3]	13,970	2,249,800
Vanadium pentoxide[3]	152.91	114,679
Zinc[3]	22,590	5,408,435

1. Fine ounces. 2. 38.5 percent Co, cwt. 3. Metric tons.

The output from Rhodesia Broken Hill Development Company Limited was maintained at 22,600 long tons of zinc, 14,000 long tons of lead and 153 tons of vanadium pentoxide. A small plant is being developed to recover cadmium from residues by distillation at the rate of approximately five tons per month.

KENYA

Area—224,960 square miles
Currency Unit—Pound
Value—$2.80
Chief Mineral Products—Soda ash, gold, kyanite.

Magadi Soda Company continues to be the most important single producer of minerals in the colony. The soda ash produced in 1951 was worth some £1,154,368 while a further £120,420 worth of salt was produced along with some byproducts of minor value.

The total value of minerals won in Kenya in 1951 is estimated at approximately £1,900,000 as compared with £1,373,000 for 1950.

The chief producer of gold continues to be Rosterman Gold Mines Ltd., which is responsible for about one half of the gold output of the colony. This in 1951 is estimated to have totaled approximately 19,000 fine ounces worth about £235,500. In 1950 production from the colony was 23,000 ounces worth £285,000.

The old Macalder mine, now renamed Macalder-Nyanza Mines Ltd., and operated by the Colonial Development Corporation, the capital of which is supplied by the British government, is being actively developed and the commercial production of copper concentrates was started during the year. Originally a gold producer only, the mine under the management of D. J. Rogers is expected to produce copper, zinc, pyrite, cobalt, gold, and lead. Diamond drilling was done to test the extent of the orebody which was estimated at about 1,000,000 tons. A dam site nearby was also investigated. Plans to provide some 2,000 kw of electricity by use of an earth fill dam were being made.

Kenya Kyanite Ltd., and East Africa Minerals Ltd., continued to produce kyanite and in the former case mullite also. A total of 2,500 tons of raw kyanite, valued at £30,000 and 8,000 tons of mullite valued at £200,000 were produced and sold.

PORTUGUESE EAST AFRICA

Area—240,000 square miles
Currency Unit—Mozambique Escudo
Value—$0.0345
Chief Mineral Products—Gold, tin, uranium.

The colony has three principal mining areas. Manica and Sofala, with gold, tin and mica. The district of Tete, with coal, corrundum, rutile, columbite, zircon, gold and uranium bearing minerals. Important deposits of good vermiculite are in the area, but cannot be mined profitably on account of expensive transport and great distances. Also the district of Alto Lingonha, with gold, beryl, bismuth, monazite, and columbite.

Several areas have been closed to

prospecting. They are gradually being opened, however. Prospecting for uranium bearing minerals has been definitely closed. The principal area for uranium minerals is the district of Tete. The existent mines are permitted to continue mining, but export is under strict government supervision. There are four small mines in operation. The uranium bearing minerals are samarskite and davidite.

The Portuguese government has created a body of technicians called Fomento Mineiro, whose aim is to help miners and promote mining in general. The work done by Fomento Mineiro is in most cases gratis to the miners. Valuable work has been done in all parts of the colony.

SOUTHERN RHODESIA

Area 150,354 square miles
Currency Unit—Rhodesian Pound
Value $2.80
Chief Mineral Products: Gold, chrome, asbestos, mica, vermiculite.

Total value of Southern Rhodesia's metal and mineral production in 1951 was a new all time high at over £15-000,000. Output of gold was the lowest since 1906 but gold retained the lead in total value of output. Chief cause of the reduction in output was the closing of the Bushtick mines in August. Mine output was down at the Wanderer Consolidated, Fred and Thistle Etna and others. The number of producers decreased by more than 60 during the year. A notable increase in production of gold was made at the Connemara mine of Frobisher Ltd. For the year ended October 31, 1951 a total of 164,990 tons of ore were milled and 29,730 ounces of gold recovered. Ore reserves were 531,200 tons of 0.24 ounce ore.

Asbestos continued as the leading non-metallic mineral in point of value. Production in 1952 should increase and the value of asbestos is expected to exceed that of gold for the first time.

A record breaking—330,989 metric tons—of chrome ore was mined in 1951.

SOUTH WEST AFRICA

Area—322,393 square miles
Currency Unit—Pound S. A.
Value—$2.80
Chief Mineral Products—Lead, copper, zinc, diamonds, lepidolite, tungsten.

Tsumeb Corporation Limited was the most important mining company in the territory. Mine and mill development and expansion designed to bring yearly output of copper, lead, and zinc from 56,000 to 85,000 tons continued during the year. The new DeWet shaft had reached a depth of 2,460 feet at the end of 1951. It will be sunk to 4,150 feet. A new steam-electric plant with a capacity of 3,000 kw was finished during the year. Production for the six months ending December 31, 1951 was 16,860 short tons of lead, 5,832 tons of copper, 5,172 tons of zinc, 190,579 pounds of cadmium, and 352,486 ounces of silver.

All known diamond areas in South West Africa are under strict control. The two main diamond concerns operating are the Consolidated Diamond Mines of South West Africa Limited, with its main operations concentrated at Orange Mouth, and Industrial Diamonds of South Africa Ltd., working at Saddle Hill on the coast about 60 miles north of Luderitz.

Small outcrops of lepidolite occur over a fairly large area surrounding the Erongo Mountains, but economic production is limited to one area, near Karibib. These mines, Rubikon, Helikon 1 and 2 and Kahlsbrunn, which were previously known as the Jooste Lithium Myne, were recently taken over by a new company, the S.W.A. Lithium

Metal and Mineral Production and Value in Southern Rhodesia in 1950 and 1951

Commodity	1950 Quantity	1950 £ Value	1951 Quantity	1951 £ Value
Gold[1]	511,163	6,344,811	486,907	6,053,727
Silver[1]	85,549	22,601	79,731	25,290
Asbestos[2]	71,527	4,615,490	77,663	5,452,108
Beryl[2]	932	62,525	1,109	91,841
Chrome ore[2]	321,553	1,219,857	330,989	1,530,998
Tin concentrates[2]	105.4	43,089	95.2	57,140
Scheelite[2]	65	15,747	234.8	293,126
Vermiculite[2]	784	1,795	553	1,069

1. Fine ounces. 2. Metric tons.

Mines (Pty) Ltd., Windhoek. The lepidolite is found in pegmatites with amblygonite, petalite and beryl. These mines are believed to contain the largest deposits of lithium bearing ores in the world.

Plans are under way to increase production of these mines to about 2,000 tons monthly, as well as the beryl output which contains a high percentage of BeO. This new company will eventually become the largest single producer of beryl in the territory.

The Bethlehem Steel Corporation acquired iron prospecting concessions from the South West Administration for the whole of the western part of the Kaokoveld up to the mouth of the Cunene River.

Output and Value of Mineral Production in Swaziland Territory For 1949, 1950 and 1951[1]

Commodity and Value	*1949*	*1950*	*1951*
Asbestos (short tons)	33,966.8	32,666.9	34,964.1
Value (£)	1,223,486	1,662,741	1,869,346
Gold (fine ounces)	2,840.61	1,793.55	321.85
Value (£)	25,443	22,182	3,974
Tin metal (short tons)	35.3	42	35.34
Value (£)	17,528	25,884	31,961
Barite (short tons)	114.26	486.51	525.3
Value (£)	637	3,106	3,355
Silver (fine ounces)	120	60.46	17.84
Value (£)	22	15	6
Total value (£)	1,267,116	1,713,928	1,908,642

1. Swaziland Geological Survey Department.

Mineral Exports and Value From Tanganyika in 1950 and 1951[1]

Mineral	*1950* *Quantity*	*1950* *£ Value*	*1951* *Quantity*	*1951* *£ Value*
Gold[2]	125,267	824,047	129,439	847,832
Diamonds[3]	70,597	746,370	8,593	86,749
Tin concentrates[4]	129.4	76,078	92.09	67,704
Salt[5]	3,936	36,008	3,870	35,496
Mica (sheet)[4]	49.05	61,054	69.96	120,370
Mica (ground)[4]	58.65	1,223	—	—
Mica (waste)[4]	25	337	—	—
Kaolin[5]	18	182	46.86	507
Lead concentrate[4]	1,093.36	97,550	2,964.59	334,256
Tungsten concentrate[4]	40.50	14,284	39.26	61,007
Magnesite[4]	81.57	489	2,672.80	13,539
Copper ore[4]	8.75	332	—	—
Lime[4]	70.00	280	190.00	850
Graphite (crude)[4]	—	—	25.00	669
Totals		£1,858,234		£1,568,979

1. Estimated. 2. Fine ounces. 3. Metric carats. 4. Long tons. 5. Metric tons.

TANGANYIKA

Area—362,688 square miles
Currency Unit—Pound
Value—$2.80
Chief Mineral Products—Diamonds, gold, lead, mica.

Diamonds continued to be the most important mineral produced in Tanganyika in 1951. The total value of diamonds exported in 1951 at £86,749, showed a large decrease as compared with the previous two years. This was due to the fact that the principal producer of the territory, Williamson Diamond Syndicate Limited's Shinyanga mine did not export any of its production owing to a dispute with regard to its sales agreement with De Beers. Production figures for Williamson Diamond Mines have not been published but it is generally considered that they are considerably in excess of the figures for 1949 and 1950.

Gold production for 1951 showed little change as compared with 1950. There were few developments in the industry and little interest was shown in prospecting for gold deposits. This is because existing producers are hard-pressed by the continued rise in the costs of production. In the last quarter of the year permission was obtained for gold producers to sell 40 percent of their output on the free market. This is of assistance to producers but in general has resulted in a gross increase in revenue of only about three percent.

The biggest increase in mineral production was in lead concentrates from

Uruwira Minerals Limited, which rose to the value of £334,000 as compared with £97,000 in 1950. This was due to the fact that their pilot plant operated for the full year in 1951. Plans were made for increasing the rate of production from the pilot figure of 100 tons per day to 1,000 tons per day and negotiations were underway with the United States government to supply the necessary finances for the purchase of machinery in the United States.

The British Colonial Development Corporation purchased claims covering some 50 square miles on the Tanganyika-Uganda border to be called the Murongo mine. Under management of W. Lightbody the property is being developed as a tin producer. Only prospecting was underway although some of the claims were in active production at the time of purchase.

The Straits Trading Company of Singapore is equipping its Kyerwa Syndicate property for tin production. A 160 kw electric generating plant will supply power for the mill which will treat ores from an open pit mine. In addition to the open pit, the syndicate has also proved an additional deposit which will be equipped at a later date. This property is situated in the same area as the C.D.C. Murongo mine and is close to the Ruanda border.

Tin production declined in quantity but due to the increased price, the value of the production showed only a small relative fall.

TUNISIA

Area—48,300 square miles
Currency Unit—Franc
Value—$0.51
Chief Mineral Products—Iron, phosphate, lead, zinc.

1951 was marked by an increase in production and exportation of all minerals, except lignite and pyrite which are no longer being mined.

The production of iron ore increased 21.75 percent over 1950, or 922,750 tons in 1951, and 757,900 tons in 1950. This was the highest tonnage recorded since 1937, when eight mines produced 970,-900 tons. The 1951 total was produced by only three mines–Djerissa 778,020 tons; Douaria 99,130 tons; and Tomera 32,880 tons. The amount exported was 910,860 tons, compared with 697,900 in 1950 and 965,300 tons in 1937, the record year.

Production of calcium phosphate amounted to 1,678,900 tons, against 1,571,880 tons in 1950, an increase of 10.14 percent. Although this quantity did not reach the level of 1938 when production totaled 2,034,200 tons, production during the last three months of 1951 indicates a total in 1952 at least equal to that of 1938. Four mines supplied this total: Gafsa 1,108,770 tons, M'Dilla 332,980 tons, Kalaa Djerda 245,820 tons, and Ain Kerma 31,340 tons. 2,097,720 tons were exported while only 1,571,-880 tons were exported in 1950.

In 1951, 166,160 tons of superphosphate were produced, against 133,380 tons in 1950; exports totaled 136,500 tons, against 152,970 in 1950. Most of it went to Brazil and New Zealand.

Lead production increased 10.47 percent, totaling 33,870 tons in 1951 and 30,660 tons in the previous year. Eleven mines, representing 88 percent of the

whole production, showed a total exceeding 1,000 tons of lead concentrate. Among them were El Grefa with 5,670 tons, Sidi bou Aouana 3,600 tons, Djebel Seneme 3,490 tons, and Djebel Hallouf 3,400 tons.

The production of sphalerite amounted to 6,510 tons, against 5,260 tons in 1950. The two principal mines were Sakiet Sidi Youssef 3,890 tons, and Djebel Ressas 2,810 tons. New flotation cells were put into opeation at the Ressas Touireug mill in July. The concessions of Nou Kehil were back in production by the end of the year.

Calamine production (745 tons in 1951 and 482 tons in 1950) came from the mines of Djebel Azered, Sidi Ahmed, and Djebel Tebage. Almost all of the zinc ore was exported to France.

Metal and Mineral Production and Value for the Union of South Africa in 1950 and 1951*

Commodity	1950 Quantity	1950 £ Value	1951 Quantity	1951 £ Value
Gold[2]	11,663,713	£144,775,837	11,516,450	£142,947,936
Diamonds[3]	1,925,526	14,388,706	2,228,911	16,344,937
Silver[2]	1,119,135	302,115	1,162,588	377,107
Osmiridium[2]	6,357	163,943	37,182	8,420,316
Copper[1]	38,811	5,651,082	1,271	837,129
Tin[1]	645	412,574	28,211	3,064,874
Antimony[1]	13,512	788,697	652	93,826
Beryl[1]	905	77,460	6	3,127
Bismuth ore[1]	16	6,794	600,767	1,585,000
Chrome ore[1]	536,215	1,408,350	1,566,546	843,048
Iron ore[1]	1,318,326	656,433	1,358	73,900
Lead ore[1]	776	42,528	836,515	3,175,099
Manganese ore[1]	831,145	3,292,493	173	117,548
Tungsten ore[1]	236	62,034	12,663	25,900
Andalusite[1]	8,320	9,415	107,368	5,448,548
Asbestos[1]	76,170	3,623,589	2,247	7,434
Barite[1]	2,500	8,477	5,030	94,701
Corundum[1]	3,529	73,602	13,537	55,000
Fluorspar[1]	6,980	22,314	362	2,189
Graphite[1]	218	1,619	11,789	24,000
Kaolin[1]	7,163	18,996	20,694	37,800
Magnesite[1]	12,767	28,137	1,961	10,000
Mica[1]	1,486	10,239	6,242	12,910
Talc[1]	4,551	12,352	27,014	131,800
Vermiculite[1]	31,497	171,533		

*Records of the Government Mining Engineer. Some value figures are preliminary for 1951.
1. Short tons. 2. Fine ounces. 3. Metric carats.

UGANDA

Area—93,981 square miles
Currency Unit—Pound
Value—$2.80
Chief Mineral Products—Tin, tungsten, columbite, gold.

Mineral production in Uganda was less during the year largely due to lack of labor for working claims by primitive means, but value was greater. There were, however, some 90 producers selling tin to the British Tin Smelting Corporation who have office at Kikagati close to the junction of the Uganda, Tanganyika and Belgian Congo borders. The Frobisher Limited (of Canada) has formally advised the Uganda administration that it proposes to develop the Kilembe mine in conjunction with the Rio Tinto Company of London. Pending the completion of the 220 mile railway that has been started by the government from Kampala westward to the Ruenzori Mountains at a cost of £4,000,000, the truck, road to Kilembe is to be improved to take 10 ton trucks and Frobisher plans to mill 3,400 tons per day until the railway gets to the property. The property has been worked at various times since 1926 and during the last year extensive development has taken place; bulk samples have been sent to Canada and a pilot mill has been erected to treat the copper-cobalt ore. Plans include the building of a township sufficient for 1,200 people on the flats near Lake George, a tunnel one mile long with a conveyor from the mine to the mill and a 10,000 kw hydroelectric plant.

Following investigations and unsuccessful offers by the British Colonial Development Corporation for tin and tungsten claims near the Ruanda Urundi border, the Uganda government called in miners who had refused the Corporations' offers and informed them that the potential output from the area had been assessed at 200 tons per year immediately and 500 tons after long term plans had been completed. Miners were urged to cooperate in the production of this vital mineral by stepping up the mechanization of their claims instead of relying on the low output of African's working by hand.

Mineral and Metal Exports and Their Value From Uganda in 1950 and 1951

Commodity	1950 Weight	1950 Value	1951 Weight	1951 Value
Amblygonite[1]	265.5	£2,389	19.4	£250
Bismuth[1]	3.7	1,641	1.82	941
Beryl[1]	43.2	2,046	(3)	(3)
Columbite[1]	5.09	1,154	19.16	16,863
Lead[1]	42.82	4,708	8.46	1,131
Tin[1]	191.74	107,900	118.72	116,335
Tungsten (Conc)	198.79	72,180	144.17	163,514
Mica[1]	—	—	1.066	200
Gold[2]	384.62	6,886	223.49	2,644

1. Long tons. 2. Troy ounces. 3. Not available

UNION OF SOUTH AFRICA

Area—472,550 square miles
Currency Unit—South African Pound
Value—$2.80
Chief Mineral Products—Diamonds, gold, manganese, platinum, chrome, copper.

TRANSVAAL

Transvaal Province, Union of South Africa continued as the world's largest gold producer. Some of the large mines are nearing the end of their lives and it is possible that the list will be shortened slightly during 1952. Against this must be set those developing units which are now nearing the production stage—such as West Driefontein, Doornfontein and Stilfontein; the smaller Ellaton mine of the Klerksdorp district and belonging to the Strathmore group which also controls Stilfontein and has a large stake in the Lucas

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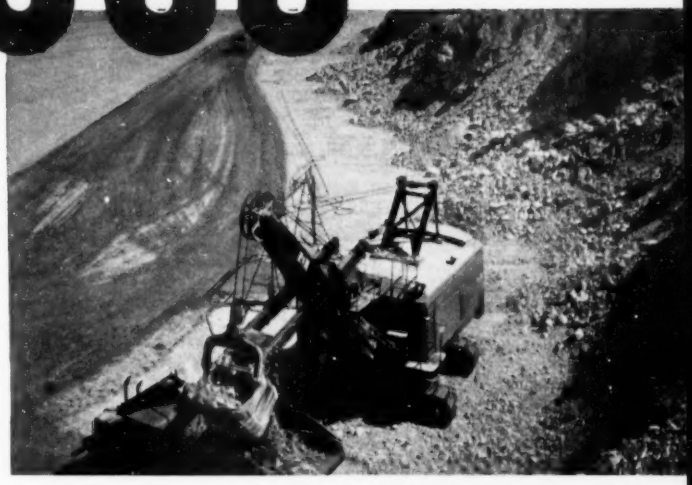

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Block south of Stilfontein in which Block favorable and very consistent drilling results have indicated the prospect of two large scale mines being added to the list of producers; and the promising area to the south of the Durban Roodepoort Deep property.

During 1951, there were fewer large gold mines, 46. These mines treated 59,589,550 tons of ore with a declared gold yield of 11,169,774 fine ounces or 3,749 dwt. per ton, valued at £138,644,821. The number of small gold mines increased to 16 and these produced 137,799 fine ounces valued at £1,710,435. The additional revenue received by the gold mining industry in 1951 from premium gold sales amounted to £6,693,001; against £2,123,547 in 1950.

Of outstanding importance to the gold mining industry of the Transvaal (and what in the future may also apply to the Orange Free State) was the implication in an official report issued late in 1951 that uranium production from the gold mines will probably be expanded further in the future. A subsequent announcement, early in 1952, stated that a central refinery for the treatment of uranium concentrates is to be erected. During 1951, two gold mines were added to the list of uranium producers—bringing the total to six, namely Stilfontein, West Driefontein, Western Reefs, Blyvooruitzicht, West Rand Consolidated, all on the West Rand and Extensions; and Daggafontein on the East Rand. Satisfactory progress has been recorded in the erection of the treatment plants, the first of which should be operating late in 1952.

Byproducts of gold mining are silver, osmiridium, and iron pyrite (the latter from West Rand Consolidated mine). In 1951, silver output was 1,162,588 fine ounces valued at £377 107; against 1,119,135 and £302,115 in 1950. Osmiridium sales in 1951 were 5,922 ounces valued at £222,318; against 6,357 and £163,943 in 1950. The production of pyrite in the first nine months of 1951 was 27,843 short tons; against 39,712 in 1950.

The principal diamond mines of South Africa are situated in the Pretoria district of the Transvaal; in the Kimberley and Barkley West districts of the northern Cape Province and not far distant from the latter, in the western areas of the Orange Free State. Greater activity was reflected in all the areas, though not in every case with an increase of output. The Premier mine, the only one in the Pretoria district of the Transvaal, expanded output to the full capacity of its new HMS plant. It produces mostly industrial stones, and the higher output in 1951—1,134,942 carats against 690,331 in 1950 was by far the greatest single factor contributing to the higher South African production in 1951.

During 1951, the Consolidated Murchison mine, the only South African antimony producer in the northeastern Transvaal, boosted output considerably.

South and southeast of Pietersburg, the asbestos fields in 1951 enjoyed an even more prosperous year than before.

Iron ore output, mainly at the Thabazimbi mine in the Rustenburg district, was again increased. In the Postmasburg area, large reserves of high grade ore have been proved and exploration is being continued. Mining by one company on a relatively small scale has been in progress for some time. A new company was formed during 1951 to exploit the medium grade ores at Airlie in the eastern Transvaal, where large reserves of about 47.5 percent iron have been proved.

CAPE PROVINCE

Mining continued on an increased scale in the Cape Province in 1951. Activity centered in the northern and northwestern part.

In the Postmasburg area, manganese output slipped from the record levels of 1950 and sales were not maintained though the value was held. The main reason for this, as with chrome, was the shortage of railroad cars.

Copper production from the O'okiep Copper Company was a record 22,707 short tons. Additional companies were reported to have taken options and to have embarked on prospecting operations —for copper, iron and other deposits

The value of sales of beryl ore and tungsten concentrates produced from the northern Cape or Namaqualand deposits was considerably higher in 1951 than in 1950.

The production of Cape Blue (crocidolite) asbestos from the Griqualand West fields of the northern Cape was at a higher level than in 1950 and the value of sales was more than maintained.

The price for the Cape diamonds was appreciably higher in 1951 than in 1950 and this raised the total value substantially. Gem stones dominate Cape output. In 1951, mine production declined to 662,256 carats from the 1950 total of 695,077.

ORANGE FREE STATE

The 1951 feature of operations in the new goldfield around Odendaalsrus was the commencement of milling and gold output at the St. Helena and Welkom mines. Development ore of a low grade formed the bulk of the tonnage treated, which in the last two months amounted to 240,900 tons with a yield of 18,545 fine ounces or 1.539 dwt. per ton milled, valued at £230,186. The yield will increase considerably as stoping progresses and more ore is mined from the stopes. Other features were the satisfactory drilling results in the Van den Heevers Rust area to the west of the Freddies mines; and also in the area immediately north of the Harmony mine (west of the Virginia property). In the future, at least one mine in the former area; and perhaps more than two mines in the latter area; seem likely to be established. Of outstanding merit during 1951, was the establishing in two successive months of world shaft-sinking records in Virginia No. 3 Shaft.

Apart from St. Helena and Welkom, many shafts have now penetrated through the principal economic horizon of the new goldfield, namely the Basal Reef. Values have been more than satisfactory in that they were well in excess of those disclosed by diamond drill holes sunk at the shaft site or in the vicinity. It is therefore quite likely that estimates of grade based on core values may have to be adjusted to higher levels.

The new production from the smaller diamond mines was probably the main reason for the slightly improved output in 1951. Mined output increased to 139,985 carats from the 1950 total of 130,788 carats; 1951 sales were 146,625 carats for £1,590,571 or 216.99 shillings per carat. Like the Cape diamonds, the Free State stones are predominantly of the gem variety. Exploration was extended in the western districts of the Free State, where some smaller mines entered the production stage.

ASIA

INDIA

Area—1,578,267 square miles
Currency Unit—Rupee
Value—$0.21
Chief Mineral Products—Manganese, iron, gold, lead, ilmenite, zinc.

India's total mineral production from mines in 1951 was estimated as valued at $166,000,000.

The significant development during the year was the drive for self-sufficiency in sulphur which is wholly imported. Experts from the United States were invited by the Indian government to investigate the possibility of recovering sulphur from the processing of copper ores. The Indian Copper Corporation, Ltd. is working on the same problem. The intensive interest led to the discovery of a pyrite deposit in Bombay state.

The recently discovered Western Lode in the Kolar Goldfield received considerable attention, and is being vigorously developed. The boom still continues in the manganese industry, and small deposits were opened up. Jigging, which was not resorted to formerly, is now carried out at practically every mine for concentrating small-sized ore. About half of the manganese mines are working on the "boulder ore" from dumps and virgin ground.

Great headway was made in the lead-zinc industry. The Metal Corporation of India is installing 1,000-kw Diesel generating sets at Zawar in Rajasthan. The energy available will be used for mining and milling purposes. From 600 to 700 tons of 50 percent zinc concentrate are expected to be produced per month. The lead concentrates obtained from the same ore will supply India with about 250 to 300 tons of lead per month. Smelter production of lead during 1952 will be about 1,500 tons, all of which will be smelted at Tundoo in Bihar. Because there is no zinc smelter in India, the concentrate has been shipped to Rotterdam. Within the next three years, an Indian smelter is to be built.

The Besshi Mining Company Ltd. started smelting and refining of nickel ores imported from New Caledonia in 1951. Shown here is the firm's Niihama smelter on Shikoku Island.

JAPAN

Area—147,690 square miles
Currency Unit—Yen
Value—$0.002778
Chief Mineral Products—Chrome, copper, manganese, iron, emery.

The Nippon Mining Co. Ltd. resumed mining and milling operations at its Oya gold mine in 1951 following the completion of mining facilities and erection of a new cyanide plant. This mine is located in Miyagi prefecture and was shut down during World War II.

In order to recover zinc contained in slag from a reverberatory furnace, a new fuming plant was completed in 1951 at the Naoshima smelter of the Taihei Mining Co. Ltd., which is located in Kagawa prefecture, Shikoku Island.

Copper slag, 6,166 tons per month, containing 6.65 percent zinc is treated and 80 percent of the zinc content is recovered. Production of zinc oxide from the fuming department amounts to 520.6 tons containing 63 percent zinc, of which 440.8 tons are refined to electrolytic zinc. The other 80 tons of zinc oxide are used for manufacturing zinc sulphate.

Production of Minerals in Metric Tons in Turkey in 1950 and 1951

Commodity	*1950*	*1951*
Bituminous coal	4,292,000	4,690,000
Lignite	1,187,000	996,500
Iron ore	253,000	230,000
Chromite[1]	400,000	456,000
Copper (blister)	11,700	17,500
Antimony	2,158	2,960
Lead-zinc ore	132	267
Manganese	22,664	29,760
Magnesite	540	590
Sulphur	5,800	7,462
Asbestos	384	412
Boracite	9,942	8,654
Emery	1,705	1,831

1. Exports of chromite by companies anad tonnages were: Eti Bank (160,000), Turk Maden Company (50,000), Fetiye Compana (30,000), Montan Paluka (30,000), Orhan Brandt (20,000), Hayri Oegelmann (15,000), Saduilah Bilgi (10,000), Sitki Kocman (10,000), and Kredit Bankasi (35,000).

Production of Metals in Crude Ore, and Refined Metals in Japan in 1950 and 1951*

Metal Contained in Ore and Concentrates	*1950*	*1951*
Antimony ore[1]	159,983	217,568
Arsenic ore[1]	1,742,076	1,043,552
Copper ore[2]	39,467	41,985
Gold ore[1]	4,085	5,311
Lead ore[2]	10,823	12,593
Mercury ore[1]	47,978	74,312
Silver ore[1]	114,388	136,328
Tin ore[2]	335	422
Zinc ore[2]	51,904	62,962
Pyrite[2]	1,910,773	2,232,358
Metals		
Aluminum[2]	24,766	36,906
Copper (electrolytic)[2]	84,210	90,947
Lead (electrolytic)[2]	16,074	17,787
Zinc (electrolytic)[2]	32,685	38,184
Zinc (distilled)[2]	16,150	18,101
Tin[2]	390	590
Gold[1]	4,591	5,327
Silver[1]	135,646	152,579

* December 1951 production estimated. 1. Kilograms. 2. Metric tons.

TURKEY

Area—296,190 square miles
Currency Unit—Turkish Pound
Value—$0.3571
Chief Mineral Products—Chrome, copper, manganese, iron, emery.

A sulphur deposit in the vicinity of the old Keçiborlu sulphur mine was found amenable to flotation. A flotation mill to treat 100 tons of ore per day producing 50 tons of sulphur will be built during 1952. The contract for construction has been let.

Murgul copper mine which started operation early in 1951 produced about 3,350 tons of blister copper. It is planned to produce close to 9,000 tons during 1952.

Steps are being taken to double the capacity of the 300 ton per day copper flotation mill at the Ergani mine because of diminishing direct smelting ore reserves.

MALAYA

Area—7,800 square miles
Currency Unit—Pound Sterling
Value—$2.80
Chief Mineral Products—Tin, iron, gold.

Mining, like all other industries in Malaya, has suffered badly in the war between Communists and the government. Conditions of war have prevented any new prospecting or the making of fresh discoveries. In addition, they deter the small mine owner from sinking new capital, in the shape of plant and machinery, in his enterprise.

Total tin production in 1951 amounted to 57,166 tons of tin-in-concentrates, a decrease of 370 tons from the 1950 figure. Production of tin concentrates during the fourth quarter of 1951, at 19,569 tons, with a metallic tin content of 14,677 tons was a post war quarterly record.

Early in 1951, PETALING No. 6, the biggest and probably the most modern dredge in the world was placed in operation at Selangor, near Kuala Lumpur, under the management of Messrs. Osborne & Chappel.

The tremendous increase in iron ore production at the Buhket Besi mine at Trengganu was one of the 1951 features of Malayan mining. Gold production fell slightly owing to the usual difficulties and the shortage of labor.

Production of Minerals in Metric Tons in Malaya in 1950 and 1951

Commodity	*1950*	*1951*
Tin	57,537	57,167
Coal	415,777	382,539
Gold[1]	18,436	17,018
Iron ore	498,903	846,803
Ilmenite	24,915	43,493
Scheelite	23	43
Columbite	8	25

1. Fine ounces.

THAILAND

Area—200,000 square miles
Currency Unit—Baht
Value—$0.0454
Chief Mineral Products—Tin, tungsten.

Tin production in Siam decreased in 1951 because few new mines were opened to replace worked-out alluvial mines. High rates of taxation and regulations on surface rights are unattractive to new foreign investors. In 1950 10,364 long tons of metallic tin were produced and the estimated 1951 production was only 9,600. Wolframite concentrate production was 1,127 long tons in 1950 and estimated at 1,100 in 1951.

Wolframite mining was carried on entirely by "hill scratching." The government had no definite scheme for the two nationalized tungsten districts at Kanburi and Ma Sarieng. Prospecting for cassiterite in the sea near Bluket was commenced in 1951 by Tromal Prospecting Ltd. Kamunting Tin Dredging Ltd. plans to construct a road from Pangnga to the Company's new leases at Bangtoe.

The Thailand Department of Mines completed its gold prospecting camp at Krabinburi. With ECA aids, they equipped lignite mines for development work at Krabi and Mamoh.

EUROPE

AUSTRIA

Area—32,360 square miles
Currency Unit—Schilling
Value—$0.03827
Chief Mineral Products—Iron, magnesite, antimony, lead, zinc.

Increased output of all minerals was the feature of Austrian mining in 1951. This increase was due to the standardization of workmen's living conditions, to better mining methods, and of greatest importance to mechanization.

Output of siderite and hematite in 1947 was 884,936 metric tons. In 1951 it was 2,369,672 metric tons; an increase of 290 percent. The largest production was from the open pit mines at Erzberg in Steirmark Province belonging to the Oesterreicher Alpine Montan Gesellschaft. This company uses many types of heavy-duty mining equipment built in the United States.

The most important copper mines are at Mitterberg, Muhlbach Province at the foot of the Hochkonig Mountains. Output of copper ore in 1951 was 84,168 metric tons. Mining is complicated by numerous post-mineral faults. Prospecting and development of other deposits was started in the Tyrol and Salzburg.

The largest zinc-lead mines are at Bleiberg, Karnten Province. The total ore production in 1947 was 50,697 tons. It was increased to 105,518 in 1951.

The magnesite deposits in the Provinces of Steirmark and Karnten are of great importance. In 1947 the output of crude magnesite was 223,146 metric tons, in 1951, it was 664,789. Of this 410,274 was mined from open pits. At Kauster 31,542 tons were mined in 1947, and 85,480 tons in 1951. Output of calcined magnesite was 208,092 tons in 1951.

CYPRUS

Area—3,584 square miles
Currency Unit—Pound Sterling
Value—$2.80
Chief Mineral Products—Copper, pyrite, chrome, asbestos, gypsum, gold.

The Cyprus Mines Corporation, owned and controlled by the Harvey Mudd interests of Los Angeles, California have acquired and operate the following mining properties on Cyprus. The mines are the Skouriotissa, Mavrovouni, Mathiati, and Apliki and have a combined area of 48.27 square miles.

The Skouriotissa, Mathiati and Apliki mines were not operating during the year 1951, but churn drilling and prospecting work was carried on at Apliki and a geological survey of the Mathiati lease area was commenced during the early summer.

An important extension to the Corporation's milling plant which was commenced in 1950, had practically reached completion at the end of 1951. This consists of an acid treatment plant comprising a roasting plant, acid plant, leaching section embracing leaching drums, classifiers and thickeners, and a cementation plant. It is anticipated that this section of the Milling Plant will be brought into operation early in 1952 and will result in a greatly increased recovery of the copper content of the mill feed.

The Hellenic Mining Company Ltd., employing an average of 814 workers and holding 42.55 square miles of mining leases increased its 1951 production of copper bearing pyrites to 214,174 metric tons compared with 148,365 metric tons in 1950 and exported a total of 207,194 metric tons during 1951 to the following countries: Germany, 106,749; France, 35,479; Czechoslovakia, 11,727; Belgium, 12,540; Holland, 7,700; Switzerland, 32,999.

The Company carried out during the year about 30,000 feet of development and prospecting work. An extensive geophysical survey was carried out during the year in most of the areas for which the Company holds prospecting permits.

The Cyprus Asbestos Mines continued its mining operations during the dry months of the year, from April to November and during that period a total of 1,599,511 tons of rock were quarried as compared with 1,406,050 tons in 1950. This tonnage yielded 457,911 tons of raw material which was treated in nine mills from which 19,043 short tons of marketable asbestos fiber was recovered as compared with 421,797 and 16,565 tons respectively during 1950. 16,715 tons were exported to a total f.o.b. value of £701,898. Countries of destination were United Kingdom, Eire, Denmark, Sweden, Norway, Western Germany, Austria, Portugal, Siam, Japan, Egypt, Israel and Syria.

The Cyprus Sulphur and Co. Ltd., is reported to have discovered the Kinousa orebody by churn drilling in the last period of 1950. Since that time two shafts have been sunk to the orebody which lies 200 to 300 feet below the surface. An adit to intersect this orebody is being driven and is 1,000 feet in length, 900 feet remain to be driven. The orebody as determined by four churn drill holes shows 250,000 tons of high grade sulphide ore carrying gold, silver, copper, zinc and sulphur. Owing to lack of equipment no attempt has been made to prove the limits of the orebody.

The Chrome Ore mine, owned by the Cyprus Chrome Co. Ltd. is situated on the slope of a valley of the Troodos Mountain range and the ore dressing plant further down in the same valley. For conveyance of ore the places are connected by an aerial tramway. The mine was worked in 1950 to a depth of 90 meters and was extended in 1951 to a depth of 120 meters where a new haulage level was opened.

In 1951, 17,300 tons of chrome ore was extracted from the mine as against 23,700 tons in 1950. All 1951 production was concentrated at the dressing plant, whereas in 1950 a quantity of lumpy ore was hand separated and the rest concentrated. 12,300 tons of chrome concentrates were recovered from crude ore and retreatment of tailings.

The exports of gypsum rock by the Gypsum & Plasterboard Co., Ltd., went down in 1951 to approximately 20,000 metric tons due to the high freight rates applicable, due to the Korean war. The company, however, has completed its grinding, calcining and bagging plants and these were put into operation by the end of the year and the first exports of plaster of paris had been arranged for the beginning of 1952. The estimated maximum yearly production is 80,000 tons of various grades and types of plaster.

Production of Copper and Pyrite Concentrates, Gold, Silver, and Other Concentrates at the Mavrovouni mine of the Cyprus Mines Corporation in 1950 and 1951

Commodity	*1950*	*1951*
Copper concentrate[1]	78,680	90,735
Chalcopyrite[1]	121,615	85,810
Pyrite flotation concentrate[1]	329,578	377,015
Cement copper[1]	981	752
Gold[2]	6,652	7,119
Silver[2]	65,443	64,732

[1] Long dry tons. [2] Fine ounces.

GREECE

Area—54,902 square miles
Currency Unit—Drachmae
Value—$0.000067
Chief Mineral Products—Lead, zinc, silver, bauxite, chromite.

Results of the encouragement given the minerals industry in Greece through ECA financial aid, technical assistance and foreign capital investments are beginning to be demonstrated. The appended table illustrates production increases for 1951 compared to 1950.

Reorganized Greek geological activities moved forward with good progress. The first geological map of Greece is expected to be published early in 1952 and a number of publications covering completed geological studies of mineral areas have been printed. No important new discoveries have been made, but known areas of significance are being investigated.

In the field of fuels, extensive developments are underway in lignite which are expected to replace solid fuel imports. Production increases are expected to reach 3,000,000 tons in 1954 from the present 195,000 tons annually.

Production and Exports of Greek Ores and Concentrates in Metric Tons, and Dollar Value For 1950 and 1951

Ore & Concentrates	*1950 Production*	*1950 Export*	*1950 Value*	*1951 Production*	*1951 Export*	*1951 Value*
Antimony ore	2,508	—	—	3,788	200	$ 22,000
Barite	20,799	20,008	$260,104	29,399	27,527	417,616.95
Bauxite	77,448	64,646	355,553	185,226	158,893	838,982.67
Chrome ore	12,631	11,926	274,298	23,268	20,308	467,184.03
Emery	—	6,710	187,880	—	10,066	200,182
Iron ore	4,623	36,592	167,044	49,378	56,053	372,458.25
Iron-manganese ore	2,780	1,052	5,260	—	—	—
Magnesite ore	26,256	4,900	78,400	63,859	17,630	200,182
Caustic magnesite	9,586	7,320	263,880	20,372	17,687	694,991.92
Manganese ore	—	—	—	10,592	11,930	153,197
Pyrite concentrates	87,678	46,406	416,754	180,120	150,167	1,431,028
Lead concentrates	1,629	—	—	3,935	353	65,615
Zinc concentrates	7,038	7,038	211,140	9,127	4,493	400,925.56

FINLAND

Area—136,054 square miles
Currency Unit—Finnmark
Value—$0.004348
Chief Mineral Products—Copper, pyrite, gold, tungsten, zinc.

The mining industry in Finland enjoyed an all time record year in 1951. Contrary to the strike-paralyzed year of 1950, it was characterized by overall stabilization, undisturbed production and increased activities in both old and new mining fields.

The included table lists mineral production in Finnish metal mines for 1950 and 1951. The 1951 figures appear unreasonably favorable due to about a 15 percent loss in 1950.

Development of Otanmäki iron titanium mine began in 1951. For this project the Finnish government advanced starting capital of 330,000,000 Finnmarks in 1951 budgets. According to the 1952 budget the project will receive a 600,000,000 mark government loan in 1952. The plans include a shaft, underground development and concentrator for starting at a scale of 500,000 metric tons annually with production to begin late in 1953. A 20 mile branch railroad now under construction will be in use in 1952.

A new shaft has been sunk and underground development is under way to start production of zinc ore early in 1952 in the new Aijala zinc mine, about one kilometer from the present Aijala copper mine. The ore will be treated in the Aijala concentrator, where additional necessary machinery has been installed.

Outokumpu Company's Nivala mine, closed down in 1947, was reopened and reequipped in 1951 and was ready to produce early in 1952.

The Outokumpu Company has taken over a new zinc field in Vihanti, discovered by the Finnish Geological Survey following local discoveries of boulders carrying zinc ore. Substantial tonnage of good grade zinc ore was located by Outokumpu in 1951. As a result, decision has been reached to open a new mine, which will become one of the leading zinc producers in Scandinavia, if not the leading one.

In 1951 a special prospecting department was organized by Outokumpu. Its first assignment has been directed to the Outokumpu area. The Finnish Geological Survey obtained a new airborne magnetometer unit in 1951.

Production of Ore, Concentrates, and Metals in Metric Tons by Finnish Mining Companies and Mines For 1950 and 1951

Company	*1950*	*1951*
VUOKSENNISKA COMPANY		
Haveri mine		
Ore milled, tons	32,643	115,000
Gold produced, kg	62	330
Copper in copper conc., tons	?	180
OUTOKUMPU COMPANY		
Outokumpu mine		
Ore milled, tons	468,488	604,215
Copper in copper conc., tons	18,430	——
Zinc in zinc conc., tons	1,750	——
Pyrite concentrate, tons	151,644	——
Aijala mine		
Ore milled, tons	81,413	84,701
Copper in copper conc., tons	1,275	——
Pyrite concentrate, tons	10,406	——
Ylöjärvi mine		
Ore milled, tons	64,839	100,946
Copper in copper conc., tons	622	——
Scheelite conc. 76% WO_3, tons	15	6
Arsenopyrite concentrate, tons	251	726
Orijärvi mine		
Ore milled, tons	36,480	43,600
Copper in copper conc., tons	140	——
Lead in lead conc., tons	143	——
Zinc in zinc conc., tons	430	——
Nivala mine		
Ore milled, tons (3 months)	——	4,048
OUTOKUMPU COMPANY PRODUCTION DATA		
Total gold from copper conc. (kgs.)	204	253
Total silver from copper conc. (kgs.)	3,606	4,892
Copper concentrate (metric tons)	——	84,314
Electrolytic copper (metric tons)	15,447	17,850
Copper sulphate (metric tons)	——	63
Zinc concentrate (metric tons)	——	6,636
Lead concentrate (metric tons)	——	392
Pyrite concentrate (metric tons)	162,050	232,546
Nickel sulphate (kgs.)	——	253
Selenium (kgs.)	——	1,457

FRANCE

Area—212,659 square miles
Currency Unit—Franc
Value—$0.002858
Chief Mineral Products—Bauxite, potash, iron, lead, zinc, pyrite, tungsten.

During 1951, France entered a period of industrial development in iron, steel, and aluminum. The activity was not so apparent with lead and zinc.

The most notable improvement in the metallurgic production was aluminum. In 1951, 91,000 tons were produced against 60,700 tons in 1950. For the same period, mining of bauxite increased from 804,000 tons to 1,125,000 tons.

Lead production in 1951 (16,700 tons of concentrate against 17,700 tons in 1950) shows a decrease owing to the temporary closing down of two mines.

An important increase in the production of zinc metal is foreseen during 1952, due both to the completion of the additional facilities at Viviez (Aveyron) which are being built by Mines et Fonderies de la Vieille Montagne and which will bring production at this plant to twice its former level, and to the installation at Auby-les-Dpuai by the Comagnie Royale Asturienne des Mines of a series of eight vertical distillation converters.

Owing to a greater mining activity, especially at Sain-Bel (Societe de Saint Gobain), the production of pyrites increased from 247,360 tons in 1950 to 280,560 tons in 1951. Tungsten ore production almost doubled (710 tons against 410 tons) owing to the improvements in the mining equipment, especially in the mines of Montmins, and to the rise in price.

Potash output was 988,000 tons in 1951. The production of potassium chloride was 769,000 tons (758,900 tons in 1950).

There was little variation in the production of asbestos from the Canari Mines (Corsica), with 6,950 tons in 1951 against 6,100 tons in 1950. A new mine is being developed at Chateau-Queyras. The company Les amiantes de France intends to start production in 1952.

The No. 1 shaft, crushing plant, concentrator and drying plant of the Outokumpu Company at Outokumpu, Finland.

NORWAY

Area—124,984 square miles
Currency Unit—Krone
Value—$0.14
Chief Mineral Products—Iron, pyrite, copper, molybdenum.

Metal production in Norway in 1951 was somewhat higher than in 1950. Additional increases are due in 1952 as most of the mines had expansion projects underway in 1951. Two mines continued to erect plants in 1951 and are scheduled for first production in 1952, they are: Sydvaranger Iron Ore Company at Kirkenes and the Skorovas Gruber pyrite mine near Trondheim. The Undal pyrite mine was reopened during 1951.

Production of Ores, Metals, and Minerals in Metric Tons in Norway During 1951

Product	*Metric Tons*
Iron ore[1]	440,000
Pyrite ore	700,000
Copper ore	23,000
Zinc-lead ore	12,000
Molybdenum ore	310
Copper	3,500
Copper (Skjaersten)[2]	15,000
Sulphur[3]	100,000
Graphite	3,500

1. Includes titaniferrous ore. 2. A 33 percent copper product from chalcopyrite. 3. Includes production from pyrite.

An extensive program of geophysical prospecting and diamond drilling was carried out during the year in northern Norway. Successful results have been reported at Roeros and Folldal.

Metallurgical testing of the ore from the Orkla Grube-Aktiebolag mines continued in an effort to extract copper, cobalt, nickel, gold, silver and sulphur from the ore. Construction of a new metallurgical testing plant at the Norwegian Technical High school at Trondheim was started. The plant will conduct flotation experiments on Dunderland iron ore and pyrite from the Grong deposits.

There was small production of silver, tungsten and the columbite minerals.

THE NETHERLANDS

Area—15,764 square miles
Currency Unit—Guilder
Value—$0.2632
Chief Mineral Products—Salt, cement.

1951 was a good year for the Royal Dutch blast furnaces at Ymuiden. Steel production rose from 490,000 tons in 1950 to about 550,000 tons. Production of steel plate still lagged behind consumption, but the planned extension of the affiliated Breedband Company probably will come into production in 1952 and the situation is expected to improve considerably then. Exports of pig iron were slightly lower in 1951 because of the shortage of scrap in Holland.

The Royal Dutch Salt Industry also had a good year, with production rising appreciably over that of 1950. Besides salt, the company also produces caustic soda, hydrochloric acid, and chlorine. The production of these commodities amounts to approximately 50,000 tons annually, and the entire output is used domestically.

The world shortage of sulphur caused a revival of interest in the anhydrite and gypsum deposits covering the salt formation in the eastern provinces. A commission was appointed to study plans for exploiting these deposits

PORTUGAL

Area—34,386
Currency Unit—Escudo
Value—$0.034542
Chief Mineral Products—Tin, tungsten, pyrite, copper.

In general, the Portuguese mining industry showed little change in 1951 in comparison to other years. The substantial increase in the production of wolframite during the year was due to the higher price for tungsten.

Mineral and Metal Production in Metric Tons in Portugal in 1950 and 1951

Commodity	*1950*	*1951*[1]
Antimony conc.	30	15
Arsenopyrite	80	4,582
Arsenopyrite with gold and silver	2,278	2,105
Arsenopyrite-cassiterite	—	818
Barite	128	455
Beryl	52	112
Tin	1,273	1,370
Chromite	45	33
Lead	591	724
Manganese ore 42%	110	8,408
Chalcopyrite		
Less than 1.0% Cu	450,507	539,046
More than 1.0% Cu	162,983	200,565
Radioactive minerals	1,689	3,759
Wolframite (65% WO_3)	2,396	4,107

1. Preliminary

Of the total of 2,150 mining concessions in force in the country, only about 300 were being worked. The greatest number being for tin and tungsten.

Geophysical prospecting followed by surface drilling located large deposits of rock-salt in the region of Caldas da Rainha-Obidos. The prospecting was done by Spanish, and Portugese engineers.

The Portugese government through its Servico de Fomento Mineiro continued its inventory of mineral reserves and extended its geophysical prospecting and diamond drilling. Results to date have been reported as encouraging and reserves of certain minerals have been increased.

ITALY

Area—119,800 square miles
Currency Unit—Lira
Value—$0.0016
Chief Mineral Products—Mercury, pyrite, sulphur, lead, zinc.

Production of Ores and Metals in Metric Tons in Italy in 1950 and 1951[1]

Commodity	*1950*	*1951*
Bauxite ore	153,433	116,956
Aluminum	37,037	37,848
Antimony ore[2]	3,695	3,063
Arsenic ore	6,500	5,500
Cadmium	75	110
Mercury ore	149,906	124,382
Mercury	1,839	1,835
Lead concentrate	62,213	48,470
Lead	37,469	24,192
Pyrite	30,461	20,200
Zinc concentrate	139,132	118,310
Zinc	38,119	34,834
Manganese ore	16,208	19,421
Silver	26,500	20,383
Gold ore[2]	49,725	46,697
Gold[3]	332	288

1. First nine months. 2. First 10 months. 3. Kilograms

SPAIN

Area—195,510 square miles
Currency Unit—Peseta
Value—$0.08913
Chief Mineral Products—Mercury, iron, lead, zinc, potash.

Mineral production in 1951 was larger than that of 1950. This was due mainly to an abundant and timely rainfall which increased the available supply of electrical power.

Lead, one of the principal products of the Iberian peninsula, was produced in slightly greater quantity than in 1950, reaching a figure of 40,840 tons. It is hoped that the 1952 output will show a further gain since the United States Government's loan will permit the operation of many mines. New mines are now being opened and waste materials are being retreated. Approximately 50 percent of the 1951 output was exported.

Production of iron ore was also greater than that of 1950, amounting to 3,350,000 tons, of which 930,000 was from Spanish Morocco. The continuing demand for iron ore brought about the reopening of many mines which had not been worked for some time.

There was an increase in the production of pyrite. In 1951, the output was 1,810,000 tons. Almost all of this came from Huelva where the heavy demand for this mineral has brought many inactive mines back into operation. Production in 1952 is expected to show a marked increase.

The yield of blister copper was 6,364 tons. The production of zinc was 21,270 tons, in contrast to 20,800 tons in 1950. There was also much activity during the year in the mining of tungsten. The tonnage produced amounted to 1,760 tons. The production of tin totalled 820 tons.

The demand for mercury was not as great as in the previous year. The industry sold 50,000 flasks. By the end of 1952 or early in 1953, it is expected that the new metallurgical installation ordered in the United States from the Pacific Foundry Company will be in operation. The new plant is expected to add materially to the potential mercury output of Almaden.

UNITED KINGDOM

Area 94,279 square miles
Currency Unit Pound Sterling
Value $2.80
Chief Mineral Products: Iron, tin, lead, fluorspar.

During 1951 there was a very slight increase in mining activity as far as base metals are concerned with most interest in lead and zinc. A few small mines were reopened and others reexamined.

The largest tin producer, Geevor Tin Mines Ltd. at Pendeen near the Lands End produced 763 tons of tin concentrate during the year and in spite of a slight fall in production since June, the output is in excess of that for 1950.

It was announced that arrangements

were made with the Crown to drive further west into the underseas section of the old Levant mine which is joining and into which a lode now being worked is extending.

South Crofty mine near Camborne produced 299 tons of tin concentrate which is considerably lower than in 1950 and was largely due to the serious mishap to the pumping plant at the end of 1950. Emergency pumps were quickly installed and the flooding of the bottom levels cleared by April. Fire also caused damage to the concentrator early in January and further contributed to some hold up in production.

As far as wolframite mining is concerned, a very profitable production was made by Castle-an-Dinas near St. Columb, Cornwall, which is a subsidiary of South Crofty mine while some prospecting for this mineral was being carried out around Kit Hill on the border of Devonshire and on Bodmin moor in Cornwall.

In Derbyshire, Constables Ltd. worked a lead-fluorspar lode known as the Bullestry vein and the Ox-close mine. The Derbyshire Stone Co. (associated with Constables) in conjunction with Johannesburg Consolidated Investments diamond drilled and intersected a lead vein which is being explored.

In Cumberland, the Greenside mine, near Ullswater continued production and a number of small mines were reopened in the Penine district and in the adjoining counties of Northumberland and Durham. Here Coalcleugh, Swinhope and Tynehead are being reopened by the Allendale Metalliferous Mining Co. and the Rookhope mine is still being worked by the Weardale Lead Co., Ltd.

Mine Production in Western Germany in Metric Tons for 1949, 1950, and 1951[1]

Commodity	*1949*	*1950*	*1951*
Lead ore[2]	41,321	44,970	50,377
Zinc ore[2]	58,290	69,260	72,942
Copper ore[2]	863	1,340	1,669
Pyrite	452,212	548,961	533,200
Iron ore (crude weight)	9,112,000	10,883,000	12,923,000
Iron ore (iron content)	2,436,000	2,939,000	3,474,000
Potash salts (crude weight)	7,280,600	8,926,534	10,847,500
Potash salts, K_2O content	748,800	1,095,800	1,323,700
Salt (rock and evaporated)	1,800,000	2,432,480	2,757,800
Graphite	[3]	7,238	[3]
Fluorspar	[3]	92,539	106,308[4]
Barite	[3]	285,226	295,737[4]
Bauxite	[3]	4,161	[3]
Columbium ore	[3]	414	[3]

1. Preliminary figures. 2. Recoverable metal content. 3. Not available. 4. January to September only

In Scotland, the Siamese Tin Syndicate and the Bangrin Tin Dredging Ltd. jointly took an option to puchase the mineral and certain rights in the Leadhills-Wanlockhead area of South Lanarkshire and North Dumfriesshire. These mines closed between 15 and 20 years ago when the price of lead was only £10 per ton.

In Cumberland, Anglo-Austral Mining Co. continued to produce acid grade fluorspar in a flotation plant started in 1950 and working on old dumps. In Weardale, Durham, a number of small mines were reopened including Blackdene by United Steel Companies, Canmock Isle near Westgate, Billing Hill mine and Wager Burn mine. The last mentioned was reopened by Fluorspar Ltd. who also produce acid grade spar from its Stanhopeburn mine.

The largest clay producer, English Clays, Lovering, Pochin and Co., Ltd. have had their new treatment and drying plant at Lee Moor, near Plymouth in operation for about two years. In this plant which is probably the largest and most modern in the world, the clay after separation is filtered in pressure filters and fed to Buell driers which are heated by exhaust steam from the company's power plant. Blending of clay slips is electronically controlled and handling is almost entirely automatic throughout.

WESTERN GERMANY

Area—96,600 square miles
Currency Unit—Deutsche Mark
Value—$0.2381
Chief Mineral Products—Iron, potash, lead, zinc, fluorspar.

As foreshadowed in last year's review, increases in mine and smelter production in Western Germany were more moderate in 1951 than in 1950. Mine Output in 1951 was about 12 percent higher

than in 1950, and smelter production 11 percent.

If there will be no political disturbances further slight increases in mine production of lead and zinc ores are to be expected in 1952. The Maubach project of the Stolberger Zink AG. is making good progress. Further projects are the development and modernization of Mechernich (Rhineland), the dewatering and reopening of a lead mine in Freyung, Bavaria, and prospecting and development work on new deposits in the Ruhr district. The target for mine output of lead in 1955 is 80,000 to 85,000 tons and for zinc 90,000 tons.

Plans to expand Western German potash production in 1952 are being made. Reconstruction of the Koenigshall and Hindenburg shafts, both operated by the Burbach concern, has been completed. These shafts were flooded in 1939. The Hildesia shaft, belonging to Wintershall is now ready to resume production after being closed down for several years, while the Glueckauf shaft, operated by Kali-Chemie, resumed production last year. A large modernization program in the Salzdetfurth mines is due to be completed shortly. Despite the loss of the Eastern German potash mines, which accounted for about 60 percent of Germany's prewar capacity, Western German production last year surpassed the entire German output in 1936.

YUGOSLAVIA

Area—99,208 square miles
Currency Unit—Dinar
Value—$0.003333
Chief Mineral Products—Iron, bauxite, copper, pyrite, lead, zinc.

Nine-tenths of Yugoslavia's iron ore production is from the Central Bosnia basin. At Zenica, in the center of this basin, a large steel mill is being erected, while an additional Siemens-Martin furnace with mixers and a large ore storage yard have already been completed. Other installations will increase the country's coke output. Zenica's capacity is to be 400,000 tons annually. Lukavac will produce 235,000 tons, and will have a chemical plant for gas treatment. Iron ore will come from the Ljubija and Vares regions.

The Lozovac aluminum mill was not able to process all of the bauxite produced during the year, so much of it was exported. New electrolysis plants have now been added to the installation. A modern laboratory was added to the aluminum mill at Strnišče, and new machines from Germany were installed. An aluminum rolling mill is being constructed near Sibenik.

The flotation mill near the main open pit of the Bor mine has been enlarged. A copper deposit was discovered near the Majdanpek copper mines. A copper rolling mill at Sevojno is under construction.

A new rotary furnace was put into operation at the Trepca lead and zinc mines, while lead and zinc deposits have been discovered in Serbia and Montenegro.

Geological surveys have found molybdenum, beryl, tungsten, and vanadium in southeast Serbia; nickel in the Kopaonik Mountains; manganese in Serbia and Montenegro; and pyrite, silver, gold, china clay, asbestos, and other minerals in other parts of the country.

LATIN AMERICA

COSTA RICA

Area—19,258 square miles
Currency Unit—Colon
Value—$0.1764 (official)
Chief Mineral Products—Gold, silver, manganese, lead.

There was a renewal of interest in mining, particularly of base metals, in this previously celebrated mining country. United States interests carried on exploration and development work for manganese and lead. Some shipments of manganese ore were made from the west coast.

Of particular interest is the work being carried out by the company Nacional Minera, S.A., which has a very promising placer gold concession on the west coast of the Peninsula de Osa in the southwest part of the Republic. Their concession covers an area of 6,000 hectares centering on the Rio Carate.

A 2¼ yard P. & H. dragline dredge was acquired during the year and is presently being transported in sections by U. S. Navy type LCT from the mainland at Golfito onto the beach near Rio Carate. Production is expected to start during May, 1952. The equipment is capable of handling some 2,500 cubic yards per day. The most difficult phase of this operation was undoubtedly the landing of the equipment at the production site, as the high seas prevalent on the west coast make very dangerous and difficult the landing of heavy equipment.

BOLIVIA

Area—416,040 square miles
Currency Unit—Boliviano
Value—$0.0165 (official)
Chief Mineral Products—Tin, tungsten, lead, silver, zinc.

The rise in the tin price during the first months of the year, to a maximum of $1.82 per pound, promised to boom the tin mining industry. Wages were increased and improvements in welfare conditions for the workers were inaugurated.

After the RFC stopped buying Bolivian tin, the price dropped to $1.12 and many mining companies faced great difficulties. A commission of United States experts visited various mines to study costs, prices and living conditions. All plans for mining, development, and plant improvement had to be postponed till a firm tin contract with adequate tin price would be concluded. Only the companies exporting their tin concentrates to the United Kingdom (Patiño Mines & Enterprises Cons. Inc., Fabulosa Mines and some smaller units) have received operating income. All the others were faced with serious financial difficulties in obtaining funds, having to pay handling charges, storage in Pacific Coast ports and export duties.

Exports of Tin in Metric Tons by Leading Bolivian Producers in 1950 and 1951

Producer	*1950*	*1951*
Patino Mines & Enterprises Cons. (Inc.)	13,722	15,070
Mauricio Hochschild S. A. M. I.	7,081	6,812
Banco Minero de Bolivia	5,154	2,482
Medianos (Grupo)	3,473	4,124
Compagnie Aramayo de Mines en Bolivie	2,159	2,692
Others	3,797	4,122

The new Military government made every effort to stimulate the mining of other non ferrous metals. Conditions for tungsten mining were improved. U. S. loans were granted to Compagnie Aramayo de Mines en Bolivie (for "Caracoles") to Mauricio Hochschild S.A.M.I. (for "Bolsa Negra") and Patiño Mines & Enterprises Cons. Inc., (for "Cami") to reestablish tungsten production.

Production of lead was stimulated by the installing of several lead smelters. The biggest (Metalbol) installed a lead pipe factory. Other leadsmelters are under construction: Tupiza, Cochabamba and Potosí.

Patiño started a geological survey for evaluating new and existing prospects under the direction of the well known geologist Dr. Federico Ahlfeld, author of *Geología de Bolivia*.

FRENCH GUIANA

Area—35,135 square miles
Currency Unit—Fanc
Value—$0.0029
Chief Mineral Product—Gold.

Gold exports fell off in 1951; only 340 kilograms were exported, compared with 430 kilograms in 1950. The Bureau Minier de la Guyana and the Societe d'Exploitation Minieres en Inini have formed a syndicate to undertake intensive exploration over the next two years.

The Bureau Minier de la Guyana has also taken over prospecting for bauxite on the southeast coast near Cayenne. First results are encouraging but it will be some time before estimates can be made of the deposits.

EL SALVADOR

Area—13,176 square miles
Currency Unit—Colon
Value—$0.40
Chief Mineral Products—Gold, silver.

The El Dorado mine of the New York and El Salvador Mining Co., a subsidiary of the New York and Honduras Mining Co., but under independent management, continued to be the largest producer in the Republic during the last year. Milling capacity was increased from the original 150 tons to 300 tons a day. However, the exploration and development program did not prove encouraging. Ore containing values as low as $6.50 could be mined at a profit in 1950. Under present working conditions, even with the increased tonnage, the cutoff has been raised to $8.50. Exploration and development work is being continued in an effort to open up known, but unexplored, veins in an effort to increase ore reserves and maintain the increased tonnage their mill is capable of handling.

Compania Minera de Oriente S.A., Ricardo Kriete president, curtailed operations at their Potosi property in north east Salvador. A flash flood inundated the mine workings during the last part of the year. Additional exploration and development work is being carried on in an effort to discover additional ore.

The Metapan Lead property continued operations on a small scale during the year, shipping concentrates to the U. S. for smelting.

Minas Montecristo, the second largest gold and silver producer continued operations successfully. A new central shaft was sunk to facilitate underground ore transportation. This will eventually result in a reduction of production costs and an increase in tonnage.

GUATEMALA

Area—42,044 square miles
Currency Unit—Quetzal
Value—$1.00
Chief Mineral Products—Lead, silver, zinc.

Due to the unsettled political conditions no great advances in exploration or development were carried out during 1951. A more cooperative attitude on the part of the government should lead to greater development.

The Caquipec mine which was originally acquired for Herbert Hoover is now being operated by his sons. Crude ore containing considerable values in silver lead and zinc is being shipped to the United States. A Mace smelter was erected at the property for testing purposes, but was shut down during the year.

Compania Minera de Huehuetenango, which started exploration of a previously worked lead property several years ago, has begun an active development program. They have built a road into the property and have made plans for a concentration and smelting plant for the very rich lead ores. Production has not yet been initiated, but should do so during 1952.

HONDURAS

Area—59,160 square miles
Currency Unit—Lempira
Value—$0.50
Chief Mineral Products—Gold, silver.

The Rosario mine of the New York and Honduras Rosario Mining Company was the largest producer. K. H. Matheson, formerly general manager and now general consulting engineer of the Company, initiated a large scale exploration program for the Company in an endeavor to locate new properties to replace the rapidly depleting Rosario mine.

The El Mochito mine which is operated by the Rosario Company, and is located near Lake Johoa, increased total footage of underground exploration and development by 8,039 to a total of 14,309 during 1951. Tonnage milled was up to 41,903 from 39,753 in 1950. Silver production declined, slightly, to 1,234,580 ounces, but lead output was up to 518 short tons. Some very outstanding and original metallurgical developments were made at the mill during the year.

Compania Minera Agua Fria S. A. milled only about 18,000 tons of mined ore. The mill capacity was increased to 40,000 tons per year and was ready for operation in December. A core drilling program initiated on the Agua Fria vein, has proved encouraging. Exploration of this vein as well as other neighboring veins to a considerable depth is anticipated. Due to the increased capacity the reduced cost of operation has allowed a reduction of mill head values and increased the commercial tonnage of ore reserves. The costs during the period of full production in 1951 were the lowest in more than 8 years of operation.

Plans are being made to roast and cyanide a considerable stock of concentrates which have been stockpiled over the years of operation, but which were not previously of commercial value due to their complex nature. Rehabilitation of the roasting and cyanide plants during 1952 will permit the handling of all these concentrates at a profit.

Henry Daft acquired the Yuscaran Gold property during the year and anticipates opening his 100 ton milling plant in 1952.

The pattern of operations at the San Andres mine of New Idria Honduras Mining Company in the Department of Copan, Honduras, changed materially during the past year in that nearly all tonnage is now being mined underground whereas in previous years the bulk of the tonnage came from surface operations. Completion of preparation for caving the underground ore block was accomplished in August, 1951 and approximately 200 tons per day are now being extracted. Addition of a Greensburg battery locomotive and a 700-foot Morse Brothers Machinery Co. jig-back aerial tram have lowered costs on transportation of ore to the mill. Improvements have been made in the 200-ton cyanide-charcoal precipitation mill resulting in improved recovery and better control of operations. Approximately 200 men are employed under the direction of E. M. Lindenau, general superintendent, and management is by Gordon I. Gould & Co. of San Francisco, California.

JAMAICA

Area—4,411 square miles
Currency Unit—Pound Sterling
Value—$2.80
Chief Mineral Products—Gypsum, bauxite.

Bauxite is the most important mineral discovered to date. Three companies, Reynolds Jamaica Mines, Ltd., Kaiser Bauxite Co. and Jamaica Bauxites, Ltd., have substantial holdings in St. Ann, St. Elizabeth and Manchester parishes.

Reynolds is engaged in the construction of its main office, power plant, and drying plant at Belmont, St. Ann. The initial mining area has been cleared and stockpiling of the ore has commenced with a view to start shipping to the United States in early 1952. The ore will be dried and pelletized at Belmont and transported by a six mile aerial tram line to Ocho Rios, where extensive harbor installations are near completion. Storage bins from which the ore will be loaded directly into a specially designed self-unloading ore ship by covered conveyors are also nearly completed. A new reduction plant at Corpus Christi, Texas, designed to cope with the Jamaican type of ore is under construction. Yearly bauxite production goal is set for 750,000 tons.

Kaiser is working on its power house and laboratories at Spur Tree, St. Elizabeth, and on a railroad yard, rotary drying kilns, a 1,000-foot pier and storage facilities at Little Pedro, St. Elizabeth. The ore will be shipped for 15 miles by rail from the mine to the installations at Little Pedro, where it will be dried and then shipped to Baton Rouge, Louisiana for processing. Kaiser expects to ship 1,500,000 long dry tons per year.

Jamaica Bauxites, Ltd. will be located at Shooter's Hill, Manchester where work is progressing on its alumina plant. This plant will be connected by a branch line to the Jamaica Government Railroad and another branch at Old Harbour will lead to its pier. Instead of bagging the alumina for shipment to Canada, Jamaica Bauxites will load bulk alumina which will save considerable loading time. It will be the first trial for shipping alumina in this manner. A new smelter is being built in British Columbia to refine the Jamaican alumina and should be finished in 1954. Mining operations are scheduled to begin during the latter part of 1952. The plant is geared to produce 100 metric tons of alumina per day and the facilities will be expanded to produce 670 tons per day during 1953.

MEXICO

Area—763,944 square miles
Currency Unit—Peso
Value—$0.1156
Chief Mineral Products—Silver, lead, zinc, antimony, copper, graphite, iron.

Mining largely marked time in Mexico during 1951, with no major plant construction or renovations. Exceptions to this were Altos Hornos de Mexico, S.A., the large iron and steel works in Monclova, Coahuila, and Cia. Fundidora de Fierro y Acero de Monterrey, S.A., in Monterrey, Nuevo Leon, Mexico's biggest iron and steel enterprise. Both completed plans for expansion of production. Altos, operated by the government, will increase its facilities with the aid of a United States loan. Fundidora, which plans a $5,000,000 to $6,000,000 investment, will use its own money, obtained from stockholders and from selling surplus lands. A Mexican syndicate, reportedly looking to the Nacional Financiera, S.A., the government's fiscal agency, for a loan, is planning to establish a large coke works at Monclova, which should aid the iron and steel industry. Lack of sufficient coke has been a bottleneck for both Altos and Fundidora. The Fresnillo Company at Fresnillo, Zacatecas, is engaged in building a $1,000,000 lead plant.

There was no significant geological work or major mineral discovery in 1951, although the large companies and many individual operators conducted exploration programs. The government, through the National Institute for the Investigation of Mineral Resources, made some important though minor discoveries of manganese, iron, silver, and lead in Oaxaca, and is continuing explorations there and in adjoining Chiapas. The most important finding was the re-discovery of a reportedly rich fluorite deposit near Rosita in northwestern Coahuila. Transportation within the area is poor, and roads must be built before the deposit can be feasibly worked. However, the deposit is considered important economically because it is a short distance from the central Texas border. This would eliminate at least a thousand miles in shipping to the United States.

Mine Production of Metals in Mexico in Metric Tons in 1950 and 1951

Metal	*1950*	*1951*
Gold	12.693	12.237
Silver	1,528.470	1,362.262[1]
Copper	61,701	67,351
Lead	258,078	225,468
Zinc	220,654	180,064
Iron	285,758	312,581
Manganese	14,461	28,524
Antimony	5,857	6,825
Mercury	128	279
Graphite	22,627	33,286
Tungsten	40	195
Arsenic	8,987	12,762

1. 44,249,127 fine ounces.

The relative inactivity in 1951 was caused by the unsettled world situation and various phases of the international market. Some lead exporters switched to Europe, attracted by the 24-cent price, but soon returned to the United States market, even at 19 cents, because of a limited market in the Old World, caused by lack of money or difficulties in getting paid promptly. However, zinc continues to go to Europe, with Belgium as the chief customer.

Silver exports were high, but mostly in the form of currency minted in Mexico. Shipments were made to Saudi Arabia, Western Germany, and Italy. Arrangements are pending with the Philippines, Pakistan, and the Dominican Republic. In 1951, Mexico's production of silver, 44,249,127 ounces, was less than in 1950.

NICARAGUA

Area—57,144 square miles
Currency Unit—Cordoba
Value—$0.1418 (official)
Chief Mineral Products—Gold, silver.

At Compania Minera La India and Empresa Minera de Nicaragua ore reserves showed a considerable increase during the year.

Although tonnages milled were slightly less than the previous year, an increase in grade of the ore milled at both mines more than compensated for the loss in tonnage. Emden's production was the highest in its history. A good grade ore body, of as yet unknown extent, was found on the lower levels at their Limon property. This discovery of values at depth is contrary to previous geological predictions and opens a new vista for production at depth in this area.

Very encouraging results have been obtained from the development of the San Lucas drainage level at La India mine. New ore bodies have been encountered that have increased the ore reserves appreciably. La India has engaged the Compania Aerofoto of Mexico to make an aerial survey of the Limon area for the purpose of geological mapping. Exploration work at the Golfo property in East Nicaragua was suspended; however, the Company is still carrying on an extensive prospecting and exploration program both in Nicaragua and in Peru.

La Luz Mines Limited's operation in the jungle milling 1,900 to 2,000 tons per day of $4.00 per ton gold ore in 1951.

This profitable operation is the result of efficient mining and milling methods based on the most modern machinery. Operating costs per ton treated have decreased consistently over the past three years. The mill makes an extraction of 91 percent of gold values through the use of flotation, followed by cyanidation. Flotation concentrates are reground prior to cyanidation.

Eighty percent of the mined tonnage comes from the underground mine serviced by four ton skips. The mine ore is crushed at the 625' elevation and loaded at the 700 level. The bottom level, 750, devloped during the past year, shows excellent grade ore. This 750 level development added considerable tonnage to reserves. Diamond drill holes probing beneath the level encountered good grade ore. Exploration along the strike of the ore zone is being done from the 500 horizon. Encouraging assay values are being encountered in undeveloped areas. The remaining 20 percent of ore is delivered from an open pit scheduled for completion in 1953.

La Luz' copper property, Rosita, situated 30 miles east of the mine, was drilled at depth where primary copper sulphides were encountered. The presence of primary sulphides beneath the oxidized zone encouraged further exploration for the extension of this sulphide zone.

Compania Minera del Jabali suspended operations on their Jabali vein at the end of 1951. Pumps and other equipment were pulled from the 900 level and it was allowed to flood. Drifting carried on for 2,500 feet on the western extension of the vein on the 700 foot level and the diamond drilling at depth showed no indication of ore. Thus passed the era of one of the oldest producing gold veins in Nicaragua. The Jabali vein had been worked without interruption for 100 years and has produced more than $12,000,000 in gold.

Improvements in milling resulted in an increase of 1.0 percent in recovery. Extraction of gold, 95.8 percent and silver, 74.8 percent, gave a total extraction of 95.1 percent for the year.

Neptune Gold Mining Company had an increased dollar production during 1951, due mainly to an increase in mill-head values.

Work is being concentrated on the development of new veins and is proving very successful. Mining on some of the older producing veins was terminated by cleaning up isolated blocks of ore and mining of pillars. Terminating this widespread operation on small blocks of ore and concentrating on the new development will serve to reduce mining costs. The mono-cable aerial tramway from the La Constancia mine to the mill was operated without major difficulty throughout the year and appreciably reduced transportation charges. An extensive exploration and development program was carried out during the year and several promising veins were opened up.

SURINAM

Area—54,291 square miles
Currency Unit—Guilder
Value—$0.2632
Chief Mineral Products—Bauxite, gold.

The Billiton Company produced about 500,000 tons of bauxite in 1951, which approximated that of the year before. Reynolds Metals Company with headquarters in the United States has shown an interest in the Surinam bauxite deposits. It has investigated the Hadley concessions in the Marowyne district near Onverwacht and has applied for concessions.

Gold production, nearly wholly derived from alluvial deposits, increased appreciably during the year, while the occurrence of diamonds was developed further.

PERU

Area—482,258 square miles
Currency Unit—Sol
Value—$0.0650
Chief Mineral Products—Zinc, lead, silver, copper, bismuth, vanadium.

Peru normally ranks, in world production, first in bismuth and first or second in vanadium; in Latin America, second in lead and zinc and third in copper. Preliminary figures for 1951 exports shown in accompanying table give a fair idea of mine production; there has probably been little ore put on dumps or stockpiles, though some exports (particularly of zinc concentrate) may have come from previous years' stocks.

Estimated 1951 Exports of Metals From Peru, Actual 1950 Exports, Increases in 1951, and Percentage Increases In Terms of Contained Metal

Metal	*1951*	*1950*	*Increase*	*Percent increase*
Zinc[1]	196,900	82,385	114,500	139
Lead[1]	97,500	69,060	28,500	41
Copper[1]	46,600	30,005	16,600	55
Bismuth[1]	253	252	1	—
Vanadium[1]	1,490	1,281	209	16
Tungsten[1]	506	440	66	15
Molybdenum[1]	10	7	3	43
Antimony[1]	1,720	1,111	609	55
Gold[2]	139,000	119,440	19,500	16
Silver[2]	19,560,000	12,687,000	6,870,000	54

1. Dry short tons. 2. Fine ounces.

The substantial increase in volume from 1950 to 1951, nearly 90 percent, was due chiefly to the stimuli of high prices and of the new Mining Code, which has simplified procedures, assured security of investments, reduced previously excessive taxation (probably increasing state revenues at the same time) and guaranteed freedom from new imposts for 25 years.

There was small scale production of tin, cadmium and indium (mainly as refined metals or alloys which are by-products of the Oroya smelter of the Cerro de Pasco Corporation: also contained in ores and concentrates); 1,000 tons or more of sulphur came from volcanic deposits in the south; several hundred tons of high grade manganese ore were exported from the Puno region, and similar quantities of lower grade ore were shipped to the Oroya smelter from the central region.

Cerro de Pasco Corporation set up a country wide Exploration Department at its Lima office.

Principal prospects and mines in the investigation stage during the year are: 1) The porphyry copper deposits of Toquepala and Quelleveco (Departments of Tacna and Moquegua) of the Northern Peru Mining and Smelting Company (ASARCO subsidiary). It is said that production is scheduled for 1955, and that molybdenum will be recovered as a by-product. 2) The Ferrobamba copper district (Department of Apurimac) of the Cerro de Pasco Corporation. 3) The Santander low grade zinc deposit (Department of Lima) being studied by The National Lead Company. 4) The Bayovar Sulphur deposit (Sechura desert, Department of Piura) of the Texas Gulf Sulfur Company. 5) The Venturosa lead-zinc prospect (Department of Lima), a subsidiary of Minas de Cercapuquio S.A.

Cerro de Pasco Corporation, the country's largest producer, had a year of increased production, as well as of much activity directed towards further increases in the future, in which the old established mines, Cerro de Pasco, Morococha and Casapalca, a young mine, Yauricocha, and a small leased mine, Julcani, played their parts. Concentrators are in course of renovation or expansion; the new refineries at Huaymanta, near Oroya, took the whole smelter output, their capacities being 100 tons and in excess of 150 tons of refined copper and lead per day. A 35 ton per day electrolytic zinc plant was nearly completed at the end of the year. Custom ores and concentrates were treated and smelted as well as those from the Corporation's mines. A $22,000,000 loan agreement was reached with the Export-Import Bank for expanding operations, chiefly in the production of refined zinc; the loan will cover only dollar expenses of the program, which includes construction of a 60,000 KW hydroelectric generating station at Paucartambo, on the eastern slopes of the Andes, and a 200 ton per day zinc plant. A symbol of changing emphasis was the dropping of the word "Copper" from the Corporation's title.

Other active operations in Central Peru, many of which help feed the Oroya smelter, were: Cia. Minera Atacocha S.A. (lead-zinc), which is installing a 6,000 hp. hydroelectric plant and increasing its concentrator capacity to 800 tons per day; Volcan Mines Company (zinc-lead) worked its new Carahuacra open pit zinc mine as well as Volcan, and, helped by a United States loan, plans to build a 350 ton per day concentrator at the new low level Volcan mine adit; Cia. Minera Milpo S.A. (lead-zinc), a new operation, is installing a 100 ton per day concentrator; Sindicato Minero Rio Pallanga (lead-zinc) is increasing its concentrator from 80 to 150 tons per day;

the Banco Minero custom concentrator at Sacracancha, near Morococha, was enlarged from 100 to 250 tons per day, to handle the output of small mines in the Morococha and Yauli areas the Banco Minero also plans a 50 ton per day concentrator at Huarochiri; Cie. des Mines de Huarón (French) produced lead, zinc and copper concentrates; Minas de Cercapuquio S.A. produced lead and cadmium bearing zinc concentrates.

Northern Peru Mining and Smelting Company is preparing for production at its Toquepala and Quelleveco porphyry deposits; construction of a 500 ton per day lead-zinc concentrator was started at Chilete near Trujillo.

Vanadium Corporation of America operated the Minas Ragra mine near Jumasha (Department of Pasco) and started a new thermal beneficiation plant to make amenable to its normal reduction process stockpiles of asphaltitic material, containing the mineral quisqueite and running about 2.0 percent vanadium.

M. Hochschild & Company were active in the ore-buying field throughout the country; they also bought the old San Antonio de Esquilache mine (lead-department of Puno) and are installing a 250 ton per day concentrator.

F. Malaga Santolalla y Hijos obtained a loan of $650,000 for construction of a road and concentrator for their Pasto Bueno (Department of Ancash) tungsten mine; objective is a production of 1,000 tons of concentrate per year.

The Banco Minero opened a 20 ton per day concentrator at Hualgayoc (Department of Cajamarca), which is scheduled for enlargement to 50 tons; and is planning to increase the capacity of its Huachocolpa (Department of Huancavelica) concentrator from 150 to 250 tons per day, as well as install a 5,000 KW power plant to sell current to small mines in the region.

San Juan de Lucanas gold-silver mine (Department of Ayacucho, a subsidiary of the Consorcio Minero) started production in May.

The Cia. Minera Santo Toribio was formed near Huaraz with an 80 ton per day lead-zinc concentrator to treat ore from the Jecanca mine.

The Pichita Caluga lead deposit (Department of Junin) was found and brought into production in 1951; it is said to contain 60,000 tons of high grade lead ore, which can be worked by an open pit.

VENEZUELA

Area—330,000 square miles
Population—5,000,000
Currency Unit—Bolivar
Value—$0.2985 (official)
Chief Mineral Products—Iron, gold, diamonds.

The Iron Mines Company of Venezuela, subsidiary of the Bethlehem Steel Company, which is working the deposit of El Pao 300 miles from the Venezuelan coast, began shipping high grade iron ore in May, 1950. During that year the total production from this deposit was 198,951 metric tons. For the year of 1951, the amount of all shipments of El Pao ore from the Port of Palua was 1,260,610 metric tons. With the facilities already installed at El Pao, at the transfer port of Palua on the Orinoco River and at Puerto de Hierro, the production is expected to increase to 3,000,000 metric tons per year. The company has extended its geological research to the iron deposits in the region of Upata, and it is expected that if the preliminary work is satisfactory the company will start the exploration necessary to prove the extent of ore deposition.

The Orinoco Mining Company, subsidiary of United States Steel Corporation, is proceeding with its plans to develop the ore body on Cerro Bolivar. The contract between the Venezuelan Government and the Orinoco Mining Co. to dredge the Orinoco River and Caño Macareo was signed November 22, 1952. The Gahagan Overseas Construction Company and the McWilliams Dredging Company of New Orleans will start dredging in March, 1952, with the McWilliams dredge, "Caribbean." The channel is to be completed to a depth of 26 feet within two years. In January, 1952, an agreement was signed with the Venezuelan Government to establish a special custom office at Puerto Ordaz, the port and town that the Orinoco Mining Co. will build on the west bank of the Caroni river at its junction with the Orinoco. This agreement will speed customs operations in the area of activity created on the Orinoco River by the mining developments. Puerto Ordaz, founded February 9, 1952, and named for the first Conquistador to explore the great river, will be the terminal point for the 90-mile standard gauge railroad that will carry iron ore from Cerro Bolivar. An access highway between the same two points will parallel the railroad. At Cerro Bolivar a town, workshops, power plant and mining installation will be set up. Surface mining by large electric shovels will first use trucks for loading rail cars, but later operations will be direct loading. Ore will be crushed and stockpiled at Puerto Ordaz and ship-loaded by conveyor belt.

The Venezuelan Government-financed enterprise, C. A. Venezolana de Diamantes, operating in the third mining district of the State of Bolivar (Icaburu-Peraitepui), produced 46,200 carats of diamonds for the year of 1951, a definite decline from the previous year. The first mining district (San Pedro de las Bocas-Uriman) where most of the nomadic free diggers are located, produced 17,026 carats of diamonds. The CAVD is expected to begin operations in the federal reserve zone of the Uriman River, where major diamond discoveries were made in 1950 and which is excluded from the normal legal procedure of claim-filing by free diggers. In such case, the production for 1952 will exceed that of 1951.

The gold production of Venezuela for the year 1951 was 77,987 grams from the second mining district (El Callao) and of 10,986 grams for the third mining district (Icabaru-Peraitepui). The Government cyanidation plant in the Callao district treated practically all of the gold from this area. The 1951 production of gold was the lowest for this century due to the 1950 closing at the Guayana Gold Mine, the only big operating mine in Venezuela. In 1951 the Venezuelan Government expropriated the property after examination by a commission composed of three mining engineers: one from Venezuela, Dr. Victor M. López; one from France, Mr. Maurice Gratacap; and one from Austria, Dr. E. Kroboth. The Commission evaluated the property at $2,450,000, which was accepted by the Federal Court of Appeal.

NORTH AMERICA

CANADA

Area—3,690,410 square miles
Currency Unit—Canadian Dollar
Value—$1.01
Chief Mineral Products—Nickel, asbestos, gold, copper, lead, uranium, iron.

Value of Canada's mining production reached a new high of $1,228,000,000 in 1951, an increase of 17.5 percent over the previous year, according to the Dominion Bureau of Statistics, Ottawa.

While higher prices for the principal base metals accounted for a large part of this gain, there were also substantial increases in physical volume of output for most of the minerals, copper, nickel, asbestos, lead were among those showing the most notable increase. Gold was an exception to the general trend, being lower both in quantity and value than in 1950.

Value of metals produced was estimated at $722,000,000, or 18.7 percent more than in 1950. Copper was up 2.4 percent in quantity and 21 percent in value. The tonnage of nickel was higher by 11 percent, while the value advanced 34 percent, and zinc rose 6.6 percent in quantity and 35 percent in value. Tonnage of lead was lower by 8 percent, but value was higher by 17 percent. Tonnage of iron ore was 31 percent greater.

Gold was again the leading mineral in terms of output value. Price of gold in Canadian currency ranged from $37.50 to $35.80 per ounce, the nominal average being $36.85. The lower price, combined with lower volume, resulted in a drop of $10,000,000 in the total of the 1951 value.

Canada's dominance in world nickel production continues unchallenged. By mid 1951 International Nickel Co. had achieved an increase of nickel production by 12,000,000 pounds annually, well ahead of schedule. Falconbridge Nickel Mines, Canada's second ranking producer of the metal, initiated a development program designed to swell production to 40,000,000 pounds annually and requiring three years to complete.

Sherritt Gordon Mines in Manitoba plans to become an important producer of nickel, in addition to other base metals, with a goal of 17,000,000 pounds of the refined product scheduled for 1955.

Canada leads the world in asbestos production, more than 90 percent going to the U.S. market. In 1951 exports were approximately 900,000 tons worth more than $70,000,000. Asbestos Corp. is planning a new development in Ontario, with Quebec properties also reporting progress. First west coast producer is being developed in British Columbia's Cassiar district.

Gold mines milled at the rate of 44,358 tons daily in 1951. Sixty-six gold producers are listed for all Canada, compared with 82 producers in 1950. An indication of the decline in gold mining, as a result of rising costs of operation, is the fact that in 1939, the last year before World War II, there were 131 operating gold mines, more than twice as many as in 1951.

Search for uranium continued in several parts of Canada, and many properties were explored. On the whole, however, there was less prospecting in 1951 than in other recent years. Highlight was production at the Ace mine of Eldorado Mining & Refining Ltd. in the Goldfields region of Saskatchewan. This is a major development, and a production rate of 500 tons a day is assured.

Canadian silver production reached a new all-time high in 1951, about 40 percent of the total being contributed by British Columbia as a result of the smelting operations of Consolidated Mining & Smelting Co. The Torbrit mine on British Columbia's Alice Arm is now the third largest producer.

Quebec's mining pace was well sustained. Barvue Mines was in the limelight with successful drilling of its zinc-silver deposit in Barraute township. The company proceeded with plans for large-scale production by open-pit mining and purchased equipment for a 4,000 ton concentrator.

Estimated value of mines production in British Columbia in 1951 was $165,000,000, up nearly $17,000,000 from the previous year. The year was marked by extensive mill building by base metal producing mines, and at the year-end eight plants were under construction, in addition to half a dozen mills completed during 1951 and in operation.

Metal Production and Value in Canada in 1950 and 1951[1]

Metals	1951[2] Quantity	Value	1950 Quantity	Value
Antimony, lbs.	1,200,000	$ 570,000	643,540	$ 215,586
Beryllium ore, tons			29	7,882
Bismuth, lbs.	234,000	546,850	191,621	431,147
Cadmium, lbs.	1,210,759	3,244,827	848,406	1,968,302
Cobalt, lbs.	947,216	1,822,600	583,806	964,003
Copper, lbs	540,967,068	149,413,083	528,418,296	123,211,407
Gold, fine ozs.	4,528,931	159,407,314	4,441,227	168,988,687
Indium, fine ozs.	1,000	2,350	4,952	12,083
Iron ore, tons	4,736,190	26,674,009	3,605,261	23,413,547
Iron ingots, tons	10,980	638,000	1,697	138,284
Lead, lbs.	304,999,067	56,119,829	331,394,128	47,886,453
Molybdenite (MoS_2), lbs.	350,000	210,000	103,550	60,059
Nickel, lbs.	274,535,580	150,647,472	247,317,867	112,104,685
Palladium, rhodium, etc., fine ozs.	162,480	7,854,083	148,741	7,578,144
Platinum, fine ozs.	154,956	14,681,796	124,571	10,255,929
Selenium, lbs.	369,000	1,191,680	261,973	633,975
Silver, fine ozs.	24,244,949	22,933,074	23,221,431	18,767,561
Tellurium, lbs.	68,500	126,180	10,075	19,143
Tin, lbs.	346,000	493,050	796,403	828,259
Titanium ore, tons	1,672	9,782	1,253	7,706
Tungsten (WO_3), lbs.	20,000	65,000	284,078	160,343
Zinc, lbs.	667,871,787	132,906,483	626,454,598	98,040,145
TOTAL VALUE		$732,771,290		$617,238,340

1. Tabulation by the Dominion Bureau of Statistics. 2. Preliminary.

AUSTRALIA

Area—2,974,581 square miles
Currency Unit—Australian Pound
Value—$2.24
Chief Mineral Products—Lead, zinc, gold, iron, tungsten, tin.

NEW SOUTH WALES

Early in 1951 at Point Lookout Antimony Mines Pty. Ltd. heavy rains caused subsidence of the mill site. Diamond Drilling indicated 15,000 tons of ore averaging 9.0 percent antimony over a width of 11 feet. Development work proceeded during the year and good tonnages of high grade ore, suitable for direct smelting were treated by O. T. Lempriere & Co. Ltd. at Sydney while the damaged mill was inoperative.

Enterprise Exploration, a subsidiary of Zinc Corporation Ltd., prepared to dewater the C.S.A. mine at Elouera near Cobar. This mine produced copper and contains lead-zinc orebodies.

Electrolytic Refining and Smelting Co. of Australia Pty. Ltd., Port Kembla continued a reconstruction program throughout 1951. Tankhouse capacity was increased and a baghouse was installed for recovery of dust. This company handles virtually all of Australia's copper output.

North Broken Hill Ltd. reported an improvement in the tonnage mined while the ore treatment plant operated very satisfactorily during the year. Lead and zinc recoveries were slightly lower but silver was the highest yet achieved, being 92.4 percent. Lower lead zinc recovery was attributed to the large tonnage of semi-oxidized ore remnants from the British, Junction and Block 14 areas.

Broken Hill South Ltd. report that sulphide ore extracted during the year was 279,319 long tons assaying 12.0 percent lead, 12.1 percent zinc and 7.8 ounces silver per ton.

QUEENSLAND

Mt. Isa Mines Ltd. experienced difficulties throughout the year with shipping. The erection of the 329 foot stack for the new copper smelter was completed and foundations poured for the new copper reverbertory furnace. It is expected that copper production will commence about mid 1952. Capacity will be 18,000 tons of copper per year.

Mt. Morgan report a net profit for the year of £A 370,707. Ore treated was 864,-900 tons assaying 2.33 dwt. gold, and 0.62 percent copper. Production was 4,168 long tons blister copper, 65,135 ounces gold and 17,415 ounces of silver. A proposal to eliminate the Edwards roasters and convert low grade matte in larger converters was considered. Technical aspects of the production of elemental sulphur were examined and a trial shipment of pyrite was sent to Noranda, Canada for testing.

WESTERN AUSTRALIA

Great Boulder Gold Mines Pty. Ltd. reported a new orebody at 3,100 foot depth in the Edwards shaft with assays over 12 foot widths reported at 5.9 dwts.

The world shortage of sulphur was reflected in activities in Western Australia, where the Department of Mines undertook drilling programs in the Kooyanobbing Ranges, Yilgarn goldfield and in the Ravensthorpe district. Norseman Gold Mines N.L. undertook an exploratory drilling campaign and increased sulphur output in pyrite concentrate from 1,000 to 1,500 tons per month. Further expansion will follow.

Protheroe lead mine at Northampton was worked by Anglo Westralian Mining Pty. Ltd. The output was increased early in 1950 to 500 tons of lead concentrate per month.

Broken Hill Proprietary commenced shipping high grade iron ore from the newly opened Yampi Sound deposits on the North West coast. The ore is shipped to Newcastle and to Port Kembla, New South Wales for treatment at the Broken Hill Pty's two steel works.

TASMANIA

Mt. Lyell Mining & Railway Co. Ltd. at Queenstown operated under difficulties throughout the year. Shortage of shipping curtailed supplies of coke for smelting and resulted in an increased stockpile of copper concentrate. Mt. Lyell is recovering 50,000 long tons of pyrite annually. This is being increased to 80,-000 tons. The concentrate is shipped to Melbourne for sulphuric acid manufacture. A stockpile of 250,000 long tons has accumulated at Queenstown.

King Island Scheelite (1947) Ltd. entered long term contracts for the sale of its products with the U.S.A. and British governments. Production for the year was 164,422 tons (160,167 in 1950) with a recovery of 964 tons (777) of scheelite concentrate. Value of output was £A 1,775,000 compared with £A 458,406 in 1950.

Aberfoyle Tin N.L. realized more from the sale of wolframite than tin. Value of production for the year ended June, 1951, was £A 730,000, nearly three times the 1950 figure. 450 long tons of tin concentrates and 146 long tons of wolframite concentrates and 150 long tons of wolframite residues were produced. The corresponding tonnages for 1950 were 455, 117 and 34 long tons.

Electrolytic Zinc Co. of Australasia Ltd. in the year to June 30, 1951, produced 77,529 tons of zinc at Risdon (83,897 tons in the previous year). The West Coast mines treated 159,429 (150,-583) tons of ore; recovering 10,084 (9,959) tons of lead concentrate, 46,153 (46,299) tons of zinc concentrate, and 3,781 (3,889) tons of copper concentrate.

NORTHERN TERRITORY

In 1951 there was intense activity by a large number of small groups and individual prospectors throughout the territory. High tungsten and tin prices stimulated prospecting and production to the detriment of the gold mining industry.

Many promising finds of radioactive minerals were reported and development and investigation of these deposits is in the hands of the Commonwealth Department of the Interior.

Australian Metal Production in 1950 and 1951

Metal	*1950*	*1951*
Gold[1]	853,467	875,400
Silver[1]	7,044,924	6,360,000[2]
Copper[3]	13,552	12,476
Steel ingots[3]	1,425,600	1,571,400
Lead[3]	161,572	199,056
Zinc[3]	83,801	84,080

1. Fine ounces. 2. First 11 months only. 3. Long tons.

Australian Development N.L. Nobles Nob mine reported sufficient ore blocked out for five years operations. Grade of ore at this gold mine since production commenced in October, 1948 has averaged more than 2.0 ounces per ton.

VICTORIA

The dredge operated at Harrietville by Harrietville (Tronoh) Ltd. continued operations throughout the year. Results for the early part of 1951 showed a working loss due to the dredge unavoidably operating in ground containing 50 percent tailing. Information gained from a boring campaign proves that the major portion of value is located 70 to 110 feet below surface level. Output is expected to improve.

Central Victoria Dredging Co. Ltd.'s Amphitheatre dredge commenced operating in June. Initial returns were low while opening out the dredging pond.

SOUTH AUSTRALIA

The South Australian government is continuing to develop the uranium deposits at Radium Hill (near Broken Hill, New South Wales). A pilot plant is in operation. An aerial magnetometer survey of the Middleback Ranges in the Eyre peninsula was carried out.

At the Broken Hill Associated Smelters Pty. Ltd.'s lead smelter at Port Pirie, construction of a contact acid plant to produce sulphuric acid from imported sulphur is approaching completion. The use of sintering plant gases in this plant is also planned and will ultimately replace sulphur as the raw material.

FIJI

Area—7,022 square miles
Currency Unit—Fijian Pound
Value—$2.48
Chief Mineral Products—Gold, silver, manganese.

On Viti Levu Island the Associated Mining Companies operate at Vatukoula in the Tavua Basin and consist of Emperor Gold Mining Company Limited, Loloma (Fiji) Gold Mines, N.L., and Dolphin Mines Limited. The group is managed from one administrative office, each company has proportionate ownership in one power house, stores department, mechanical and electrical shop, timber yard and central milling plant.

Mining methods include open cut work as well as several forms of underground stoping methods, particularly overhand cut and fill (hydraulic) owing to use of inexperienced native miners.

For the year ended 27th of June, 1951 the central milling plant treated a total of 180,852 long tons (168,023 in 1950)

Ore Milled, Gold and Silver Production and Value in Fiji in 1950 and 1951

Item	*1950*	*1951*
Tonnage milled	173,298	184,427
Gold, fine ounces	103,423	95,635
Gold value	£1,432,252	£1,324,567
Silver, fine ounces	37,740	24,869
Silver value	£7,542	£8,429

of ore averaging 11.92 pennyweights per ton. Residues averaged 1.04 pennyweights per ton giving an extraction of 91.3 percent.

In September 1951, the government sanctioned the sale of 40 percent of the Associated Companies' gold on the free market. The increase in revenue has already been largely offset by increased taxation, wages and costs of all supplies.

Taxation rates in the colony are not such as to encourage the mining industry and the amount paid by the Emperor and Loloma companies for royalty and taxation on gold for the year ended 27/6/51 amounted to approximately $530,500. This sum represents 46.5% or 51.7% respectively of the gross profit (of these companies) after providing for depreciation and develoment.

An extensive churn and diamond drilling program is being carried out on present known ore bodies and on contiguous leases.

The recent increase in base metals price has revived interest in the Sawakasa district of Viti Levu where certain development and diamond drilling has disclosed an ore body of sizeable proportions carrying low values in gold and silver but promising values in base metals, notably zinc with lesser quantities of copper and lead.

FRENCH OCEANIA

Area—643 square miles
Currency Unit—Franc
Value—$0.016
Chief Mineral Product—Phosphate.

The Compagnie Francaise des Phosphates d'Oceania is continuing to actively mine its deposits in the Isle of Makatea. It extracted 216,400 tons of phosphate from these deposits in 1951, and 270,000 tons in 1950. The repair of the equipment, the upkeep of which had suffered much during the war, has been completed, as well as the installation of new arrangements to stock mineral and a tramway to serve the distant places of extraction.

INDONESIA

Area—733,000 square miles
Currency Unit—Rupiah
Value—$0.2632
Chief Mineral Products—Tin, bauxite.

Metal mining in Indonesia, with the exception of tin and bauxite, remained practically inactive during 1951. Gold mining was not resumed because the mines were still flooded, and, for the greater part, were occupied illegally by native workmen. Bauxite production amounted to an average of 50,000 tons monthly and tin production totaled 2,650 tons monthly.

Shareholders in the South Bantam Mining Company in South Java decided to dissolve the company, while the Bengkalis Gold Dredging Company made plans to resume operations within a short time. This company has large concessions with gold-bearing alluvial deposits. Average gold content is reported as 200 milligrams per cubic meter.

NEW CALEDONIA

Area—8,458 square miles
Currency Unit—Franc
Value—$0.0158
Chief Mineral Products—Nickel, chrome, manganese.

Nickel is the most important mining resource of New Caledonia; 220,000 tons of nickel ore were produced in 1951, compared with 157,650 tons in 1950. With ECA funds, Societe le Nickel, the largest company, has modernized its mines, installing an aerial tramway, as well as rapid-loading facilities.

About 86,000 tons of chrome ore were extracted last year. Compagnie Caledonienne des Metaux received funds from the ECA to finance a program of increased production. The company will pay back the advanced capital, plus four percent interest, by deliveries of concentrated chromium.

PHILIPPINE ISLANDS

Area—115,600 square miles
Currency Unit—Peso
Value—$0.50
Chief Mineral Products—Gold, chrome, copper, iron, manganese.

The year 1951 witnessed a substantial gain in mining production for the Philippines, both in gold and in base metals. The gold production increased from 333,991 ounces in 1950 to 393,602 ounces in 1951—an increase of 18 percent. Thus, from the shambles of World War II, within the short span of five years, the Philippine mining industry has recovered and again entered the ranks of the first 10 gold producers of the world.

At the beginning of 1951 there were but nine gold mines in production. At the end of the year 11 mines were producing with two additional mines scheduled for operation early in 1952. Much is yet to be accomplished as prior to the war, the Philippine's boasted of 54 active gold producers.

During 1951 the gold mining industry continued to be greatly benefited by the Islands' laws which permit the gold mines to sell 75 percent of their production in the free market. During the year the free market remained well over 100 pesos per ounce thus yielding the companies substantial premiums over the official price of 70 pesos ($35.00) per ounce.

The year 1951 saw a great improvement in the base metal mining industry. This industry showed an overall gain of 73 percent in value during the year. The total yield was 40,055,735 pesos as compared with 23,194,614 peso; for 1950. In monetary value the gains in the principal base metals produced were copper, 81.5 percent; chromite, 59 percent; and iron, 86.5 percent. Whereas in the years prior to the World War the base metals yielded only 10 to 14 percent of the total Philippine metal production, the value of base metals now exceeds that of the precious metals.

Production of Metals and Ores in the Philippine Islands For the Years 1949, 1950 and 1951[1]

Commodity	*1949*	*1950*	*1951*
Gold[2]	287,844	333,991	393,602
Silver[2]	218,419	216,034	274,602
Chromite[3]			
Metallurgical	81,404	41,846	32,736
Refractory	165,340	208,665	301,836
Iron ore[3]	370,172	599,095	903,282
Copper[4]	7,007	10,384	12,712
Manganese ore[3]	26,288	29,867	22,343
Lead[3]	550	879	571
Zinc[3]			155

1. 1951 production figures by courtesy of the *Philippine Trade Review*. 2. In fine ounces. 3. In metric tons.

Production of non-metallics is also a growing source of income to the Philippines. Figures for 1951 in quantity and value are as follows: cement, 1,850,927 bbls., 20,705,065 pesos; coal, 150,691 M.T., 3,390,553 pesos; rock asphalt, 30,321 M.T., 680,655 pesos; gypsum, 399 M.T., 17,510 pesos; sand, gravel, salt, and other nonmetallics valued at 7,311,847 pesos.

Total value of non-metallic production was 32,105,630 pesos. The entire mining industry of the Islands during 1951 yielded in excess of a 100,000,000 pesos. If gold premiums are added, the value of 1951 production in terms of dollars approximated $55,000,000.

PRODUCTION EQUIPMENT PREVIEW

P **Production** **Potential**
This **E** section makes **E**conomies and increases **E**arning
P **P**ossible **P**ower
Production **P**racticable,
thru a **E**quipment that offers **E**fficient
Preview **P**roducts

HAULAGE EQUIPMENT: The Pressed Steel Car Company has had over 50 years of experience in solving difficult underground mining problems and their engineers are available to give you constructive help in reducing mine haulage costs with dependable, trouble free locomotives and a variety of mine cars. Circle no. 1.

ADJUSTABLE MINE FANS: Joy Axivane fans offer simultaneously adjustable blades that insure top ventilating efficiency no matter how your air demand changes. For full details on their complete line, circle no. 2.

CUT REPAIR COSTS: Resisto-Loy can save you repair costs by rebuilding worn crusher mantle liners with easily-applied Magnatone. Surfaces up to one and one half inches thick are not uncommon and service tests indicate that the rebuilt surfaces outlast the original liners by as much as one third. Circle no. 3.

NEW CONVEYOR BELTING: Goodyear belts using fabric carcasses of Du Pont's new high-strength Cordura rayon have been found to train better than former belting materials due to the reduced overall thickness of the finished belt made possible by fabric layers of greater strength. Get Du Pont's new Cordura booklet, "Sinews for Industry," by circling no. 4.

REDUCE SURFACE HAULS: Many remote mines that have electric power are finding that by using Pittsburgh Lectromelt smelting furnaces, in sizes from 50 to 50,000 kva, the cost of transporting bulky ores and concentrates is eliminated. Let Lectromelt help you. Get their new bulletin 104, describing their furnaces and services by circling no. 5.

TRUCK BODIES AND HOISTS: Complete information on heavy duty Heil bodies for your off-the-road dumptrucks or earth movers, and Heil hydraulic dumptruck hoists will be sent to truckers who circle no. 6.

DIESEL FUEL PUMP TESTS: Research by Cummins Engine Company has resulted in standardized fuel pump testing equipment and procedure. Since correct engine performance cannot be assured unless the fuel pump is properly tested and accurately set, the new methods are considered to be an important advance in Diesel maintenance. For more information on the equipment and procedures, circle no. 7.

CAT-MOUNTED LOADER: The Traxcavator, designed for mounting on a standard Caterpillar tractor, is one of the most versatile loading tools available for general mine and mill work. Shovel clean-up, truck loading, and stockpile transfers are but a few of the applications where Traxcavators have saved operation dollars. For more information, circle no. 8.

DRUM SEPARATORS: Wemco's Mobil-Mills using the newly-designed drum separators offer HMS at low initial cost, low operating cost, and compact design with cleaner, sharper separation into either two or three products. For more information, circle no. 10.

MILL EQUIPMENT: The Hardinge Company has published a bulletin that describes their complete line of classifiers, conveyors, feeders, filters, etc. To obtain this bulletin, circle no. 11.

PILOT SMELTING SERVICE: The Mace Company will make working scale tests on your ore in lots of one ton or more to determine how much you can save in transportation and treatment charges with their furnaces and sintering hearths. Preliminary reports will be made on the receipt of ore analyses. Their new catalog is now available for further details. Circle no. 12.

BLASTERS NOTE: The Coast Manufacturing and Supply Company has a fuse for every blasting requirement. Save blasting dollars by using the right fuse on every job. Maximum economy, safety, and efficiency in fuse use is explained in Coast's published material. Circle no. 13.

STOPER SAVES CARBIDE BITS: Chicago Pneumatic's CP-34 stoper assures long service from expensive tungsten-carbide bits by combining the right piston and rotating speed, stinger pressure, and hammer blow. The drill features graduated control of feed-leg and an instantaneous pressure release. For complete information, circle no. 14.

REMOTE CONTROL FOR VALVES: Those inaccessible, hard-to-get-at valves can now be controlled with complete confidence by Ledeen actuators, adaptable to any make, size or type of valve installation. For remote-control actuator bulletin no. 512, circle no. 15.

HARD-FACING ALLOY RODS: The Victor Equipment Company has announced the publication of five new bulletins on their line of tungsten carbide rods for electric or acetylene application. To obtain these informative releases, circle no. 16.

POWER SCRAPER: The Wooldridge Manufacturing Company's new Model TC-S142 Terra Cobra self-propelled power scraper with a heaped capacity of 17.5 cubic yards is described in a new bulletin that can be obtained by circling no. 67.

PNEUMATIC TOOLS: The Newage International, Inc., describes its complete line of famous Desoutter portable pneumatic tools and accessories featuring new and patented features in a catalog recently released. For a copy, circle no. 50.

TRUCK PARTS: If you are operating outside the continental limits of the United States and are looking for parts and units, either new or rebuilt, for any or all makes of civilian and surplus military trucks and vehicles, air mail your specific needs to the Mutual Truck Parts Company, Inc., 2000 South Wabash Avenue, Chicago 16, Illinois. For more information on the vast supply of parts carried by Mutual, circle no. 57.

SELF-ALIGNING BELT IDLERS: Jeffrey's catalog 785 describes their complete line of self-aligning and troughing-type belt idlers as well as a pivoted-type return idler used for both troughing and flat belt conveyors. To learn how Jeffrey belt conveyors can cut your handling costs, circle no. 17.

MINE-HOIST DRIVES: General Electric, a company with experience covering over 900 hoist-drives now in use, has published bulletin GET-1430 that covers problems connected with mine hoists under the title, "Electric Equipment for Mine Hoists." For a copy, circle no. 18.

TIMBER PRESERVATIVES: Osmosalts and Osmoplastic are preservatives that will increase the life of mine timbers from 3 to 5 times. To get Osmose Wood Preserving Company's book, "Force Down Your Operating Costs," that describes Osmose treatment, circle no. 19.

CONVEYOR SYSTEMS: Hewitt-Robins, the only manufacturer offering a complete mine conveyor—machinery, belt, motor, reducer, and drive—has made available the detailed specifications on their many conveyors. Circle no. 20.

STRONGER WIRE ROPE: Hercules flattened strand wire rope offers the greatest strength and durability in any given size of rope since its unique design packs more steel per inch of diameter than any conventional rope and allows sheave contact by four external strands rather than one, as in most ropes. For more details, get Leschen's "Wire Rope Handbook." Circle no. 21.

TRAMP IRON REMOVAL: Stearns suspended magnets are designed to protect expensive crushers, grinders, pulverizers and other vital equipment by completely removing tramp iron from mill circuits. Stearns also has available all necessary laboratory and testing facilities for separation tests on your materials. For further information and their descriptive literature on magnets, circle no. 22.

LIGHT-DRILL FEEDLEG: The increased size of the new Consolidated Pneumatic feed-leg for light rock drills overcomes all tendency to whip, gives greater rigidity, and prevents breakages in any drilling position. A simplified throttle and a new mounting bracket that insures alignment make this the ideal one-man rig. Circle no. 23.

LOW COST DC POWER: General Electric's Ignitron mercury-arc rectifiers are efficient, dependable, mine-proven sources of d-c power. Units are available in portable or stationary models from 75 to 1000 kw ratings. For further information on the simplicity of installation and ease of maintenance of G-E's rectifiers, send for bulletin GEA-3706 by circling no. 24.

ENGINEERING SERVICE: Recognizing the importance and necessity of correct solutions to diesel power problems, Worthington offers complete engineering services based on a century of experience and research in the power supply field. Before installing new equipment, get further details on the Worthington service designed to give you the most efficient power source available for your specific needs by circling no. 25.

DUST RECOVERY: Buell Engineering Company has a new bulletin on "The Collection and Recovery of Industrial Dusts." The 28-page book has complete information on systems of recovery that will boost plant yield, improve product and process, and eliminate air pollution. For a copy, circle no. 26.

ORE TRAMMERS: The Mancha division of Goodman Manufacturing Company has published a detailed bulletin on their complete line of storage battery locomotives from the versatile Little Trammer to the heavy-duty Mainliner Electric Mule. For a copy of bulletin MH-471 on this varied line of trammers, circle no. 27.

TELESCOPIC STOPER: The new LeRoi-Cleveland offset stopers have telescopic legs that provide feeds up to 52 inches and are designed to be used under any and all drilling conditions with emphasis on roof bolting and confined-space operations. For full details, circle no. 28.

REAR-DUMP HAULERS: Worldwide use of Tournarockers has shown that these rear-dump haul units boast features designed to rapidly deliver greatest output at lowest cost. With the ability to turn in a radius only half its overall length and with front wheel power for safe bank dumping, the Tournarocker is available in sizes up to 35 tons. For more information, circle no. 29.

FILTERS: Complete engineering data on synclinal type filters from 5 to 100 gallons per minute for sump or line installations on all hydraulic and low pressure liquid recirculating systems are contained in a folder recently published by the Marvel Engineering Company. For a copy of this bulletin, circle no. 30.

CENTRIFUGAL PUMPS: A new bulletin describing the function, sizes and capacities of their centrifugal pumps has just been issued by the Morris Machine Works. To obtain a copy of this handy, pocket-size reference, circle no. 31.

PREVENT IDLER FREEZE-UP: Rex Triple Labyrinth grease seals have been engineered to prevent the entrance of grit and dirt to the all-important backbone of conveyor systems—the idler. For trouble-free conveyor service, write for Chain Belt's bulletin 51-81 on Rex idlers. Circle no. 32.

CUT MILL PARTS COSTS: The Allis-Chalmers grinding mill diaphragm has been improved to reduce down time, maintenance man-hours, and replacement expenses. With thicker grate ribbing, special bolt protection and greater flexibility, the new diaphragms are improving mill operation and lowering milling costs. Circle no. 33.

SPECIAL TRACTOR TOOLS FOR MINING: Hyster accessories for Caterpillar tractors, including the "Hystaway" ½ yard excavator and a complete line of winches, yarders, cranes, and donkeys. Provides versatile range of uses in mining operations. Complete literature available from MINING WORLD. Circle no. 34.

TIMBER SAWS: A Titanpower chain saw is a lightweight unit for one or two man operation that makes fast and easy work of cutting and framing mine timbers. The saw comes with 26" to 60" straight blade bars or a 19" bow. For a bulletin on the complete line of Titan saws, circle no. 35.

AGITATOR-CONDITIONER: The Denver Super-Agitator and Conditioner now features recirculation ports to eliminate short-circuiting, adjustable collar for better recirculation control and a rubber-covered wearing plate to prevent sanding up during shutdown. To solve your conditioning problems, circle no. 36.

SINTERED BIT MATRICES: Anton Smit & Company offer a line of diamond bits designed to answer the specific requirements of any drilling problem. The tungsten alloy powdered metal matrices of these bits are available in three hardnesses for abrasive, hard, or soft formations. For full information, circle no. 37.

LOW-COST HMS: One of the simplest and most effective devices for using HMS on low-grade ores is the Hardinge counter-current separator. Without using scrapers or internal moving parts, the unit moves float in one direction and sink in the other. The Hardinge separator, proven successful on low-grade Mesabi ores, is detailed in bulletin 39-B-3. Circle no. 38.

HEATED SCREENING: By passing an electric current through the wires of the screen cloth, the Leahy screens equipped with FlexElex give faster and easier separation when processing damp, fine materials. For bulletin 15-J describing these heated screens, circle no. 39.

SAMPLE REDUCERS: Denver Fire Clay crushers and pulverizers will reduce hard rock samples from 2½ inches to 100 mesh at the rate of 50 pounds per hour. For more information on these compact, rugged units, circle no. 40.

CONTRACT CORE DRILLERS: The E. J. Longyear Company, manufacturer of a complete line of diamond core drills and equipment, offers contract drilling, development, and shaft sinking services based on successful worldwide experience in the exploration for all types of minerals. Details on their complete facilities are available by circling no. 41.

ROASTERS, CALCINERS: Pacific multiple hearth furnaces are available in sizes that range from a 36" laboratory model to a 22' 3" production unit. Full details on the ability of these furnaces to roast, calcine, and dry a wide variety of ores and non-metallics can be obtained by circling no. 42.

PARTS REPAIR: Parts subject to abrasion no longer need to be replaced because of wear—Amsco hardfacing rods can be quickly and inexpensively applied to form a new surface that will outlast the original unhardened part up to three times. For information on Amscoating, circle no. 43.

PULP PUMP: The new Wilfley Model K rubber-lined centrifugal sand pump has been specifically designed for the rugged, heavy duty required by mill circuits and is available in a variety of sizes to meet every pumping requirement. For full details, circle no. 44.

FILTER FABRICS: Due to a time-tested combination of virgin wool and synthetic fibers, FumeAll fabrics have the superior

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filtering characteristics of all-wool cloths and the strength as well as the heat, alkali, acid and moisture-resistance of synthetic materials. For samples and additional details, circle no. 45.

NEW MAGNETIC SEPARATOR: Dings Magnetic Separator Company is now producing a new cross-belt type EBK unit for the concentration of such slightly magnetic materials as monazite, garnet, hubnerite, ferberite and manganese. Full information on new features, including a new pole nose construction that has doubled separating capacity, is available by circling no. 46.

POCKET GEIGER COUNTER: The Morgan Instruments Company has developed a new geiger counter that weighs less than half a pound including headphones and measures one inch in diameter and four inches long. The unit is permanently sealed, waterproof and self-charging, requiring no external power source. Priced under $30, the unit is one of the smallest sensitive counters yet developed. Circle no. 47.

ECONOMICAL CRUSHER: The whys and wherefores of Telsmith's reputation for high-capacity, low-upkeep gyratory crushers are detailed in gyratory bulletin 271. Circle no. 48.

LEVELING DEVICE: The Filter and Injector Company has produced a device that simply, efficiently, and permanently levels heavy equipment. The gadget is built in the form of two steel wedges connected longitudinally by a bolt and requires only an ordinary socket wrench for adjustments when leveling. Circle no. 66.

JET-PIERCING: Detailed information on the fundamentals and practice of jet-piercing, the revolutionary new aid to more rapid surface mining, is available in a booklet published by Linde Air Products Company. For your copy, circle no. 68.

JETAIR FLOT CELLS: By complete, controlled dispersion of air at the impellar periphery, Morse Bros.' "Jetair" cells insure the highest possible recovery in all flotation circuits. For a copy of flotation bulletin 482, circle no. 51.

CUSTOM-BUILT BELTS: For insurance that conveyor and elevator installations will give you the maximum service under any and all conditions, take advantage of Thermoid's experience. Their book no. 3679 shows how to choose the custom-built belt that will fit your specific needs. Circle no. 52.

MINERALIGHT: Ultra-Violet Products, Inc. have published brochure MW "Prospecting for Scheelite with Ultra-Violet" for those interested in this strategically-important mineral. The booklet also describes the company's complete line of ultra-violet lamps and tells how they may be used for tungsten, mercury and uranium minerals. Circle no. 55.

ESTIMATING BOOK: The Euclid Road Machinery Company has revised and enlarged its book entitled "Estimating Production and Costs of Material Movement with Euclids," widely used by engineers and estimators for many years. The book, adaptable also to equipment other than Euclid, can be had by circling no. 59.

STATIONARY DIESEL: The National Supply Company's bulletin 5202 offers a complete description of the model 65 Superior stationary diesel, designed for heavy duty, continuous operation as a prime mover on dredges, in crushing and power plants, or wherever dependable power is needed. This engine is available in hp. ratings from 600 for the 6-clyinder model to 1500 for the supercharg:d 8. Circle no. 60.

SHRINK FITTING: For information on how to eliminate expensive and time-consuming arbor pressing and set screws in parts assembling, get the Miskella Infra-Red Company's folder on the Miskella Infra-Red shrinker, available for jobs of any size or nature where shrunk fittings are adaptable. Circle no. 61.

ROCK DRILLERS BOOK: A new 44-page book published by Sandvik is now available for those interested in Coromant steels, Atlas Diesel drills and pneumatic pusher legs. This valuable report has complete details on reconditioning bits and the use, care and maintenance of drilling equipment. Circle no. 62.

DRILL DIAMOND REPORT: The Industrial Distributors, Ltd. have published their annual report summarizing articles and patents bearing on industrial diamonds that have been published during 1951. Copies can be obtained by circling no. 63.

BLASTING METER: A new blasting meter—a combination voltmeter, ammeter, and blasting galvanometer—for practical field use with industrial explosives was announced by Hercules Powder Company's explosives department. For a descriptive booklet on the new meter, circle no. 64.

ROAD GRADERS: The Meili-Blumberg Corporation has placed into production a new series of road graders, known as the Models 42, single drive, and 44, tandem drive, incorporating many unusual design features. For more data, circle no. 69.

THROWAWAY BIT SERVICE: The Throwaway Bit Company maintains a complete service department for the reference of potential Throwaway bit users who are interested in testing performance in their own mine or for instructing miners in the use of Throwaway bits. For further information, circle no. 71.

SCREEN GUARDS: Wedge-Wire's Kleenslot screen guards protect valuable fine-mesh screen by keeping larger lumps of material from reaching the delicate meshes. Illustrated literature on the newest in non-clogging, non-binding screens can be obtained by circling no. 72.

UNDERGROUND JUMBOS: Rogers Jumbos have hydraulic jib arms with self-leveling operator's platforms, independently driven tracks, mast platforms adjustable to any height and electric motor drives. For a copy of Rogers Jumbo bulletin, circle no. 73.

PRE-FAB MINE BUILDING: Columbian all-metal buildings have proven utility for all types of weatherproof surface structures through sectionalized, prefabricated construction that affords low-cost erection, strength, and minimum upkeep. Circle no. 74.

LOW-COST MILL SAMPLER: The Galigher Company, long famous for its Geary-Jennings sampler, has developed a new, compact unit—the Galigher Junior—for sampling low-tonnage streams of wet, dry, solid, or liquid material. The new sampler is based on accepted standards for true sampling and was designed for systems where larger, more expensive units are not adaptable—a natural for the small-mill operator. To get the Galigher Junior leaflet, circle no. 75.

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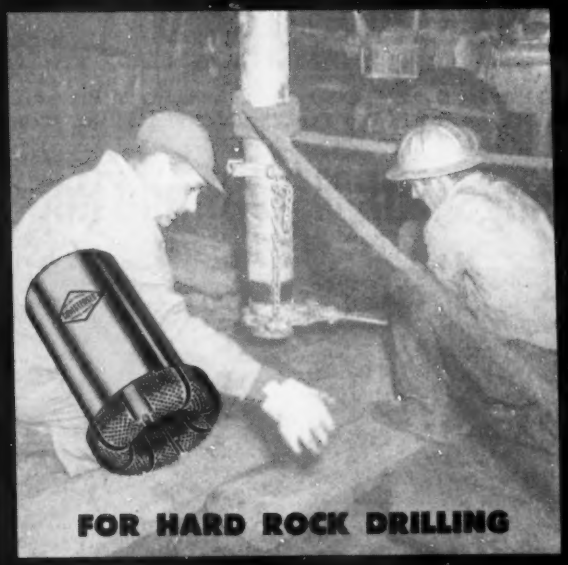

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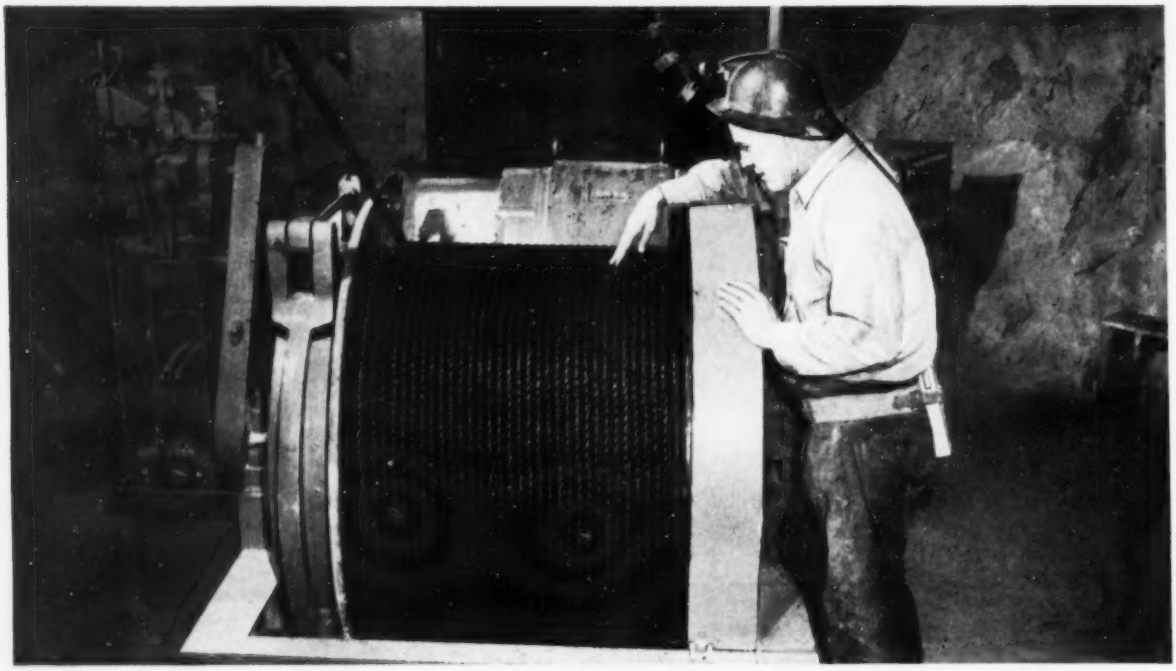

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FEDERAL MINING AGENCIES

UNITED STATES GEOLOGICAL SURVEY

The Geological Survey is charged with geological mapping, preparing the National Topographic Atlas, classifying public lands, and determining the Nation's reserves of water, minerals and metals.

Conservation Division

The Conservation Division's major functions are: (1) to examine and classify the public lands with respect to mineral and water-power resources; and (2) to enforce the mineral leasing laws. Vital supplies of hydrocarbons, phosphates, potassium compounds, sodium compounds, lead, zinc and vanadium are obtained from lands under Federal or Indian lease.

The Mining Branch, one of four Branches of the Conservation Division, is a regulatory and supervisory body responsible for the proper conduct of mine operations, including prospecting, development and production of coal, potassium, phosphate, sodium, silica sand, oil shale, and sulphur on public land leases; of gold, silver, mercury, vanadium, and quartz on various land grants; and of all minerals, except oil and gas, on segregated, restricted, and allotted Indian and acquired land leases. The Branch also enforces the operating and safety regulations under the various mineral leasing acts pertaining to Federal and Indian lands in the United States and Alaska.

At year's end, December 31, 1951, there were 1,202 properties under supervision in 28 states and Alaska, whose yearly output had a value in excess of $108,000,000. Supervision of the leases is effected through seven regional and district offices. The tonnage of products mined from supervised properties during 1951 is shown in the tabulation below:

Product	Tonnage Mined 1951
Coal	9,321,441
Potash	5,437,729
Phosphate	96,468
Sodium	675,304
Lead and Zinc Conc.	53,755
Miscellaneous	1,591,477
Total	17,176,174

Geologic Division

The Geologic Division is concerned with geologic investigations and appraisals of minerals and mineral fuels in the continental United States, Alaska, Puerto Rico and foreign countries.

In the United States, 95 projects covering 35 metallic and non-metallic mineral commodities in 39 states were in progress in 1951, and well over half of these were focused on strategic minerals. Cooperating with the Defense Minerals Administration, and later with the Defense Minerals Exploration Administration and Defense Materials Procurement Agency, geological evaluations were made of most of the applications for government aid for exploration and production of and from mineral deposits.

Regional mineral resource studies were in progress in New York and the New England states, Rogue River basin, Oregon and the Arkansas-White-Red River basins in the south central United States as well as resource evaluations of individual mining districts. The geochemical prospecting unit continued its development of new techniques; and rapid tests for arsenic, antimony, tin and selenium were being investigated.

In the field of mineral fuels, geologic mapping and surface and subsurface stratigraphic projects were carried on in 22 states in areas where prospects for discovery of new sources of oil and gas look promising.

In addition, detailed mapping and calculation of reserves of oil shale were also continued in western Colorado and eastern Utah. Important coal- and lignite-bearing areas were mapped in Pennsylvania, Kentucky, Ohio, Indiana, Arkansas, North and South Dakota, Wyoming, Montana, Colorado, Utah, New Mexico, and Washington. Reappraisals of the coal reserves of North and South Dakota, Indiana and Virginia were essentially completed in 1951 and will be published shortly, and new reappraisal projects were started in Colorado and Oklahoma.

The Alaskan investigations involved coal, petroleum, raw materials for construction purposes, some metal-bearing districts, and one reconnaissance project.

Geologic work in foreign countries is being carried on through the State Department and in cooperation with the foreign governments concerned.

The Geological Survey's geophysical program supplemented the field investigations, and included about 21,000 miles of airborne magnetic and 10,000 of airborne-radioactivity traverse as well as ground magnetic, electrical, geothermal, and seismic investigations. A total of 35,000 miles of aeromagnetic traverse were compiled, 57 aeromagnetic maps published and 14 preliminary maps placed on open file.

Geologic field investigations were assisted by laboratory studies and research in geochemistry, petrology, and paleontology. More than 40,000 samples of rocks were analyzed and studies on physical-chemical processes and the paragenesis of minerals were continued.

UNITED STATES GEOLOGICAL SURVEY

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Millard L. Reyner, Room 315, P.O. Building, Butte, Montana

UNITED STATES BUREAU OF MINES

The Bureau of Mines during 1951 directed its scientific, technologic and economic research toward assuring an adequate supply of strategic metals, minerals and fuels for the expanding national defense program; strictly long-range projects were recessed to permit concentration upon those of immediate urgency.

Throughout the year the Bureau responded to requests for technical and economic data from various Government departments and agencies directly concerned with national security.

Metals and Nonmetallics

The Bureau made major progress toward developing economic methods of utilizing low-grade manganese ores and other manganese-bearing materials. After the technical feasibility of recovering manganese from open-hearth steel furnace slags was established the Bureau cooperated with the iron and steel industry to make the process economic.

Further studies directly relative to domestic steel production included (1) economic extraction of deep-seated and low-grade iron ore deposits, (2) ore movement from Labrador to lower lake ports through the proposed St. Lawrence seaway, and (3) methods of increasing national self-sufficiency in important ferro-alloy metals.

Bureau exploration projects outlined commercial or near-commercial deposits of copper, lead-zinc, antimony and mercury ores. Upon establishment of the mineral exploration assistance program (originally the DMA, later the DMEA), the Bureau engineers served with Geological Survey geologists on field teams to determine the feasibility of proposed projects and check the performance on those approved.

In the field of high-temperative metals, capacity to produce pure zirconium was doubled and additional data were gathered on the physical properties of ductile titanium and its alloys.

To safeguard domestic aluminum production, now largely dependent on foreign ores, the search for a method of beneficiating submarginal domestic bauxite deposits was continued.

Other programs dealt with the technology and economics of obtaining sulfur from sources normally wasted, pegmatite mining and ore-dressing, and synthetic production of mica and asbestos.

Fuels and Explosives

The Bureau's studies of fuels last year emphasized coking coal, natural and synthetic petroleum products, lignite, and anthracite. The Lignite Research Laboratory at Grand Forks, North Dakota, was completed, and a new wing for the Anthracite Research Laboratory at Schuylkill Haven, Pennsylvania, was begun. Techniques for producing synthetic liquid fuels from oil shale and coal reached the point where the Secretary of the Interior recommended that private industry establish plants with Government financial assistance available under present legislation. The coal-hydrogenation demonstration plant produced gasoline which was tested successfully in military vehicles. At Louisiana, Missouri, a second coal-to-oil plant, using the gas synthesis process, was completed and put through two integrated test runs.

Capacity for producing grade A helium of 99.995 percent purity was increased to meet growing demands.

The Bureau of Mines advanced fundamental research on the ignition of firedamp by explosives, the explosive characteristics of various dusts, and the methods of preventing or limiting dust explosions. A number of special explosives studies were made for the Army, Navy and Air Force.

Health and Safety

Safety programs included the national first-aid and mine-rescue contest at Columbus, Ohio, in October, and acceptance by the Bureau of the Holger-Nielsen method of artificial respiration to supplement the prone pressure and Sylvester methods already taught. During the year, for the first time, a Diesel locomotive met the Bureau's permissibility schedule, more rigid than those used in other countries where Diesel haulage is long-established. To supplement its established first-aid, mine-rescue and accident-prevention courses, the Bureau introduced short courses in roof control and haulage safety. Further progress was made in fundamental research on the physics of supporting mine roof.

U. S. Bureau of Mines

Department of the Interior Washington 25, D. C.

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Washington Office: Interior Building, Washington 25, D. C.

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Regional Director: Stephen M. Shelton, Box 492, Albany, Oregon.

REGION III, SOUTHWESTERN
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Regional Director: Harold C. Miller, 1012 Flood Bldg. 870 Market St., San Francisco 2, California.

REGION IV, ROCKY MOUNTAIN
Arizona, Colorado, New Mexico, Utah, Wyoming
Regional Director: John H. East, Jr.; 224 New Customhouse, Denver 2, Colorado.

REGION V, NORTH CENTRAL
Iowa, Michigan, Minnesota, Nebraska, North Dakota, South Dakota, Wisconsin
Regional Director: Paul T. Allsman; 2908 Colfax Avenue South, Minneapolis 8, Minnesota.

REGION VI, SOUTH CENTRAL
Arkansas, Kansas, Louisiana, Oklahoma, Texas, Missouri except the Coal-to-Oil Demonstration Plant at Louisiana, Missouri.
Regional Director: Clifford W. Seibel; 814 Barfield Building, Amarillo, Texas. This region also has jurisdiction over the Navajo Helium Plant near Shiprock, New Mexico, and all pipe lines and other facilities connected with or serving those properties.

REGION VII, SOUTHEASTERN
Alabama, Florida, Georgia, Mississippi, North Carolina, South Carolina, Tennessee.
Regional Director: Hewitt Wilson; Box 217, Norris, Tennessee.

REGION VIII, NORTHEASTERN
Connecticut, Delaware, Illinois, Indiana, Kentucky, Maine, Massachusetts, Maryland, New Hampshire, New Jersey, New York, Ohio, Pennsylvania, Rhode Island, Vermont, Virginia, West Virginia, and the Coal-to-Oil Demonstration Plant at Louisiana, Missouri.
Regional Director: Harold P. Greenwald; 4800 Forbes Street, Pittsburgh 13, Pennsylvania.

Region IX, Foreign Minerals
Regional Director: Elmer W. Pehrson; Interior Building, Washington 25, D. C.

DEFENSE MINERALS EXPLORATION ADMINISTRATION

The Federal Government, through the Defense Minerals Exploration Administration (DMEA), U. S. Department of the Interior, is taking an active part in the search for new domestic sources of metals and minerals which are essential to our national defense. Although the minerals exploration program was not announced until April, nearly 200 contracts were signed in the remaining 8 months of 1951, by which the Government loaned six and one-half million dollars to prospectors in 22 States and the Territory of Alaska to encourage the investigation of potential sources of mineral wealth.

The exploration program, for which provision was made in section 303(a)(2) of the Defense Production Act, was launched by the Defense Minerals Administration (DMA) with the issuance of order MO-5 on April 6, 1951. Upon the assignment of certain responsibilities for the defense minerals program to the Defense Materials Procurement Agency (DMPA) under the President's executive order of August 28, 1951, the DMA was renamed "Defense Minerals' Exploration Administration." The DMEA, a separate agency within the Department of the Interior, is responsible for carrying on the exploration program.

The objective of the program is to stimulate exploration for presently unknown or undeveloped sources of strategic and critical minerals by helping prospectors and mine operators finance the costs of exploration and by sharing the risks involved. The contract entered into between the operator and the Government employs the matching principle. The Government's share is determined on a percentage basis, related to the degree to which the location of new sources of supply for a particular mineral is essential to the successful prosecution of the defense program. The amount of the loan, without interest, is repayable from the net return from any ore, concentrate, or metal produced as a result of the exploration program within 10 years of the date of the contract.

Applications for exploration loans must relate to a single project, the completion of which within 2 years is anticipated. Potential projects are investigated by field teams composed of Geological Survey and Bureau of Mines geologists and engineers before final action is taken by the Defense Minerals Exploration Administrator.

During the period April 6 to December 31, a total of 1,119 requests for Government aid on exploration projects were received. By December 31, 196 contracts, valued at $10,913,543, had been executed. The Government's participation in these contracts totalled $6,487,195. Denials and withdrawals accounted for 374 applications, while 492 were in various stages of processing as the year closed. Lead-zinc led the list of commodities for which loans were approved, followed by tungsten and mica. Other commodities covered by 1951 approvals were antimony, asbestos, beryl, cadmium, cobalt-nickel, copper, fluorspar, manganese, mercury, monazite, steatite talc, sulphur, thorium, tin, tungsten, and uranium.

DEFENSE MINERALS EXPLORATION ADMINISTRATION

Department of the Interior Washington 25, D. C.

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ACTING DEPUTY ADMINISTRATOR ....Frank E. Johnson
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INFORMATION OFFICER .....Fred W. Murkland

DMEA FIELD TEAMS

Contacts for Field Investigations

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REGION IV, ROCKY MOUNTAIN
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Executive Officer: J. H. East, Jr., Bureau of Mines, 224 New Customhouse Bldg., Denver 2, Colo.

REGION V, NORTH CENTRAL
North Dakota, South Dakota, Nebraska, Minnesota, Iowa, Wisconsin, Michigan
Executive Officer: A. B. Needham, 2908 Colfax Ave., South Minneapolis 8, Minn.

REGION VI, SOUTH CENTRAL
Kansas, Louisiana, Oklahoma, Texas, Arkansas, Missouri.
Executive Officer: David Gallagher, 221 West 3rd St., Joplin, Mo.

REGION VII, SOUTHEASTERN
Tennessee, North Carolina, South Carolina, Georgia, Florida, Alabama, Mississippi.
Executive Officer: Robert A. Laurence, Room 13, Post Office Bldg., Knoxville 1, Tenn.

REGION VIII, NORTHEASTERN
Illinois, Indiana, Ohio, Kentucky, Virginia, West Virginia, Maryland, Massachusetts, New York, Vermont, Maine, New Hampshire, Connecticut, Rhode Island, New Jersey, Delaware, Pennsylvania.
Executive Officer: McHenry Mosier, Bureau of Mines Eastern Experiment Station, College Park, Maryland.

DEFENSE MATERIALS PROCUREMENT AGENCY

The Defense Materials Procurement Agency (DMPA) is an emergency organization, established August 28, 1951, by Presidential Executive order for the development of metals and minerals resources, both domestically and abroad. It was created to centralize Federal activities with respect to the supply of metals, minerals, and other materials, and to effect that flow of materials necessary to meet production and stockpile objectives, and to maintain the civilian economy.

In creating the Federal organizational structure to bolster American defenses during the current emergency, the President made the DMPA responsible for:

(*Continued on page* 129)

DEFENSE MATERIALS PROCUREMENT AGENCY

Washington 25, D. C.

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Deputy Administrator	Howard I. Young
Assistant Deputy Administrator	James Douglas
Assistant to the Deputy Administrator	Julian W. Feiss
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Defense Materials Procurement Agency

Continued from page 127

1. Purchasing and making commitments to purchase metals, minerals, and other materials for Government use or resale;

2. Encouraging the development and mining of critical and strategic metals and minerals;

3. Guaranteeing loans to potential producers of metals or minerals when necessary to expedite production and deliveries;

4. Installing additional equipment in Government-owned and privately-owned plants.

In addition, DMPA makes certifications with respect to the need for direct Government loans by the Reconstruction Finance Corporation, and for the issuance of tax amortization certificates by the Defense Production Administration. It is responsible for providing the mining industry with priorities assistance for maintenance, repairs, operating supplies, capital additions and construction; for processing applications for access roads to mine properties, and for ensuring adequate manpower, housing, energy, and transportation to maintain and wherever possible to expand the production of critical metals and minerals.

On the basis of studies of requirements and of existing and potential supplies, DMPA develops programs and uses all authorized methods for expanding sources of supply. Insofar as requirements cannot be met by increased production in the United States, DMPA stimulates additional output in other areas of the Free World. Offices are being established in various countries so that potential suppliers may have ready access to officials with authority to make decisions. Missions are sent to other countries to investigate mining projects which may make major contributions to meeting urgent needs. Close working relationships are maintained with other Government agencies with responsibilities relating to the mining industries. DMPA leans heavily upon industry, both for trained personnel and for the counsel of Industry Advisory Committees. Programs for mica, columbium-tantalum, zinc, manganese, antimony, lead, copper and other materials have been considered with Industry Advisory Committees.

Substantial achievements have already been effected in expanding capacity and developing new sources of supply. Under agreements already entered into with producers, the rate of annual supply of copper will be increased by more than 200,000 tons by 1955. By the same date, under assistance of various types already provided for, the annual supply of zinc will be increased by 175,000 short tons; the annual supply of cobalt will be increased by 5 million pounds; the annual output of acid-grade fluorspar will be increased by 40,000 short tons; nickel, by 30,000 short tons. By 1955, new and expanded iron ore mines will be providing an additional 30 million tons per year. Programs underway will result in further expansions for these and many other commodities.

POSSIBLE MARKETS—

ORES—METALS—NON-METALLICS

—AS COMPILED BY THE ECONOMICS DIVISION, U. S. BUREAU OF MINES

ANTIMONY

American Smelting & Refining Co., 120 Broadway, New York 5, N. Y.
Bowers Battery & Spark Plug Co., Reading, Pa.
Bradley Mining Co., 425 Crocker Bldg., San Francisco 4, Calif.
The Eagle-Picher Co., P. O. Box 278, Galena, Kans.
Foote Mineral Co., 10 East Chelton Ave., Philadelphia 44, Pa.
The Glidden Co., 1396 Union Commerce Bldg., Cleveland 14, Ohio.
Hudson Smelting & Refining Co., 85 Hyatt Ave., Newark 5, N. J.
Kansas City Smelting & Manufacturing Co., 2223 Guinatte Ave., Kansas City, Kansas.
Morris P. Kirk & Son, Inc., 2717 So. Indiana St., Los Angeles 23, Calif.
Metal & Thermit Corp., 120 Broadway, New York 5, N. Y.
National Lead Co., 111 Broadway, New York 6, N. Y.
Pennsylvania Smelting & Rfg. Co., 3100 E. Ontario St., Philadelphia 34, Pa.
Philipp Bros., Inc., 70 Pine St., New York 5, N. Y.
Pope Trading Corp., 75 West St., New York 6, N Y.
Rare Metal Products Co., 522 Cortlandt St., Belleville 9, N. J.
Rochester Smelting & Rfg. Co., Inc., 26 Sherer St., Rochester 2, N. Y.
C. Tennant, Sons & Co., Empire State Bldg., 100 Park Ave., New York 17, N. Y.
Wah Chang Corp., 233 Broadway, New York 7, N. Y.
Watson Geach & Co., 25 Broadway, New York 4, N. Y.

ASBESTOS

American Brake Shoe Co., American Brakeblok Division, 4600 Merritt Ave., Detroit 9, Mich.
American Hair & Felt Co., 1828 Merchandise Mart, Chicago 54, Ill.
Armstrong Cork Co., 1010 Concord St., Lancaster, Pa.
Asbestos Corp. of America, 90 West St., New York, N. Y.
Asbestos Textile Co., Inc., 226 N. LaSalle St., Chicago 1, Ill.
Atlantic Asbestos Corp., 2128 West Chester Ave., Bronx 61, N. Y.
Atlas Asbestos Co., 500 Mitchell St., North Wales, Pa.
Carolina Asbestos Co., Davidson, N. C.
The Celotex Corp., 120 S. LaSalle St., Chicago 3, Ill.
Commercial Solvents Corp., Agnew, Calif.
Crane Packing Co., 1810 Cuyler Ave., Chicago 13, Ill.
Detroit Gasket & Mfg. Co., 12640 Burt Rd., Detroit 23, Mich.
R. J. Dorn Co., Inc., 5300 Tchoupitoulas St., New Orleans 15, La.
Eagle-Picher Co., American Bldg., Cincinnati 1, Ohio.
Flintkote Co., 4111 R.C.A Bldg., New York, N. Y.
The Garlock Packing Co., 250 Main St., Palmyra, N. Y.
General Motors Corp., Inland Mfg. Division, 2727 Inland Ave., Dayton, Ohio.
The B. F. Goodrich Co., 440 S. Main St., Akron 18, Ohio.
Goodyear Tire & Rubber Co., 1144 East Market St., Akron 16, Ohio.
Johns-Manville Corp., 22 East 40th St., New York 16, N. Y.
Lasco Brake Products Corp., 2619 Magnolia St., Oakland 7, Calif.
Milwaukee Insulation Co., 4410 W. Lisbon Ave., Milwaukee 8, Wisc.
Nicolet Industries, Inc., 70 Pine St., New York, N. Y.
Owens-Illinois Glass Co., 965 Wall St., Toledo, Ohio.
Palmer Asbestos & Rubber Corp., 180 N. Michigan Ave., Chicago 14, Ill.
Philadelphia Asbestos Co., 2010 N. 10th St., Philadelphia 40, Pa.
Philip Carey Mfg. Co., 1935 Easton Bldg., Lockland, Cincinnati 15, Ohio.
Raybestos-Manhattan, Inc., Raybestos Div., 940 Rayman St., Bridgeport 2, Conn.
Republic Filters Inc., 204 21st Ave., Paterson, N. J.
Rostone Corp., 136 S. Earle Ave., Lafayette, Ind.
Ruberoid Co., 500 Fifth Ave., New York 18, N. Y.
F. E. Schundler & Co., Inc., 504 Railroad St., Joliet, Ill.
Smith & Kanzler Corp., Linden, N. J.
Standard Asbestos Mfg. Co., 860 Evergreen Ave., Chicago, Ill.
Standco Brake Lining Co., P. O. Box 93, 2701 Clinton Ave., Houston 1, Tex.
Thermoid Co., 400 Whitehead Rd., Trenton 6, N. J.
Union Asbestos & Rubber Co., 332 S. Michigan Ave., Chicago, Ill.
U. S. Gypsum Co., 300 West Adams St., Chicago 6, Ill.
U. S. Rubber Co., Textile Dept., 1230 Sixth Ave., New York 20, N. Y.
Victor Mfg. & Gasket Co., 5752 Roosevelt Rd., Chicago, Ill.

BARITE GRINDERS

(Possible Buyers of Crude Barite)

Acme Barite Co., Mineral Point, Mo.
Arizona Barite Co., Box 926, Mesa, Ariz.
Barium Products, Ltd., Box 8-A, Newark, Calif.
Baroid Sales Division, National Lead Co., 830 Ducommun St., Los Angeles 12, Calif.
Barytes Mining Co., Potosi, Mo.
The Glidden Co., Chemical & Pigment Division, 766 50th Ave., Oakland 1, Calif.
Industrial Minerals & Chemical Co., Sixth and Gilman Sts., Berkeley, Calif.
Industrial Minerals, Inc., York, S. C.
Kennedy Minerals Co., 2552 East Olympic Blvd., Los Angeles 23, Calif.
Magnet Cove Barium Corp., P. O. Box 6504, Houston 5, Texas.
Mobar Corp., Mineral Point, Mo.
Mudrite Chemical Corp., P. O. Box 590, Hatch, N. M.
F. E. Schundler & Co., Inc., 504 Railroad St., Joliet, Ill.
J. R. Simplot Co., Boise, Idaho
Yuba Milling Co., 300 Montgomery St., San Francisco, Calif.
L. A. Wood, Box 72, Sweetwater, Tenn. (Makes crushed barite only.)

(Possible Buyers of Crushed or Ground Barite for Use in Glass)

Anchor-Hocking Glass Co., 109 N. Broad St., Lancaster, Ohio.
Ball Bros., Ryan and Burt St., Muncie., Ind.
Brockway Glass Co., Brockway, Pa.
Buck Glass Co., Fort and Silica Sts., Baltimore, Md.
Commercial Glass Co., Fairmont, W. Va.
Diamond Glass Co., Royersford, Pa.
Foster-Forbes Glass Co., Marion, Ind.
Glenshaw Glass Co., Glenshaw, Pa.
Hazel-Atlas Glass Co., 1942 Danneburg St., Wheeling, W. Va.
A. H. Kerr & Co., Sand Springs, Okla.
Latchford-Marble Glass Co., P. O. Box 4707, Los Angeles, Calif.
Owens-Illinois Glass Co., Duraglas Bldg., Toledo, Ohio.
Owens-Illinois-Pacific Coast Co., 135 Stockton St., San Francisco, Calif.
Sterling Glass Co., Lapel, Ind.
Thatcher Manufacturing Co., Elmira, N. Y.
Vitro-Agate Co., Parkersburg, W. Va.

(Possible Buyers of Ground Barite for Use in Paint)

Amalgamated Paint Co., Inc., Pier 11, North River, New York, N. Y.
Armstrong Cork Co. 1010 Concord St., Lancaster, Pa.
Atlantic Paint & Varnish Works, Wilmington, N. C.
Baker Paint & Varnish Co., 224 Suydam Ave., Jersey City, N. J.
E. S. Browning Co., 1515 Third St., San Francisco, Calif.
C. E. Butler Co., 2868 Hanna St., Oakland 8, Calif.
Chilton Paint Co., 10 15th Ave., College Point, N. Y.
Clement Coverall Co., 615 Van Hook St., Camden, N. J.
Durable Paint Co., 373 Hamilton Ave., Brooklyn, N. Y.
Fisher Thorsen & Co., Inc., 2100 N. W. 22nd Ave., Portland 10, Ore.
Ford Motor Co., Dearborn, Mich.
W. P. Fuller & Co., 301 Mission St., San Francisco, Calif.
General Paint Corp., 2627 Army St., San Francisco 19, Calif.
R. M. Hollingshead Corp., 8840 Cooper St., Camden, N. J.
Jaegle Paint & Varnish Co., 1607 South 20th St., Philadelphia, Pa.
Longview Paint & Varnish Co., Longview, Wash.
R. N. Nason & Co., 151 Potrero Ave., San Francisco, Calif.
Stay & Day Paint Materials, 2530 E. 14th St., Los Angeles, Calif.
Tri-City Paint Co., 1220 Fourth St., Berkeley 2, Calif.
U. S. Gypsum Co., 300 W. Adams St., Chicago, Ill.
U. S. Kalsomine Co., 50 Church St., New York, N. Y.
Wesco Waterpaints, Fifth and Grayson Sts., Berkeley 2, Calif.

(Possible Buyers of Ground Barite for Use in Rubber)

Armstrong Cork Co., Lancaster, Pa.
Atlantic Tubing & Rubber Co., 1756 Cranston St., Providence, R. I.
Bowling Green Rubber Co., Hoag and Prospect Sts., Toledo 6, Ohio.
Castle Rubber Co., East Butler, Pa.
Firestone Tire & Rubber Co., Akron, Ohio
General Asbestos & Rubber Co., North Charleston, S. C.
R. M. Hollingshead Corp., Camden, N. J.
Johns-Manville Co., Manville, N. J.
Laurie Rubber Reclaiming Co., New Brunswick, N. J.
Linear Packing & Rubber Co., 6464 State Rd., Philadelphia, Pa.
Okonite Co., Passaic, N. J.
Quaker Rubber Co., 4915 Comly St., Philadelphia 24, Pa.
Seiberling Rubber Co., Akron, Ohio.
U. S. Asbestos Division Raybestos-Manhattan, Inc., Manheim, Pa.
U. S. Rubber Co., 1232 Sixth Ave., New York 20, N. Y.

(Possible Buyers of Crude Barite for Use in Lithopone)

Eagle-Picher Co., American Bldg., Cincinnati, Ohio.
The Glidden Co., Chemical Pigment Div., 766 50th Ave., Oakland 1, Calif.
New Jersey Zinc Co., of Pa., 160 Front St., New Pork 7, N. Y.
Ozark Smelting & Mining Co., 101 Prospect Ave., N.W., Cleveland 1, Ohio.

(Possible Buyers of Crude Barite for Use in Barium Chemicals)

Barium Products Ltd., Newark, Calif.
Barium Reduction Corp., Drawer 1, South Charleston, W. Va.

Chemical Products, Cartersville, Ga.
E. I. du Pont de Nemours & Co., Du Pont Bldg., Wilmington 98, Del.
Mallinckrodt Chemical Works, St. Louis, Mo.
National Lead Co., Titanium Div., 111 Broadway, New York, N. Y.

BENTONITE

American Colloid Co., Merchandise Mart Plaza, Chicago 54, Ill.
Bradford Oil Refining Co., Bradford, Pa.
Cities Service Refining Co., Boston, Mass.
Commercial Minerals Co., San Francisco, Calif.
Gulf Refining Co., 260 S. Broad St. Philadelphia, Pa.
Harshaw Chemical Co., 47 Ann St., New York 7, N.Y.
Humble Oil and Refining Co., P. O. Box 2180, Houston, Texas.
Industrial Minerals and Chemical Co., Berkeley, Calif.
Lever Bros. Co., Cambridge, Mass.
Magnolia Petroleum Co., Beaumont, Texas.
Pure Oil Co., 35 E. Wacker Dr., Chicago, Ill.
Quaker State Oil Corp., Emlenton, Pa.
Richfield Oil Corp. of New York, Chanin Bldg., New York, N.Y.
Socony-Vacuum Oil Co., 26 Broadway, New York, N. Y.
Standard Oil Co., of California, 225 Bush St., San Francisco, Calif.

BERYLLIUM

Beryl Ores Co., Box 409 Route 1, Arvada, Colo.
Beryllium Corp., Reading, Pa.
Brush Beryllium Co., 4301 Perkins Ave., Cleveland 3, Ohio.
Clifton Products, Inc., Painesville, Ohio.
Foote Mineral Co., 18 W. Chelten Ave., Philadelphia 44, Pa.
Philipp Bros., Inc., 70 Pine St., New York 5, N. Y.
C. Tennant, Sons & Co., Empire State Bldg., New York 1, N. Y.

BISMUTH (Metallic)

J. T. Baker Chemical Co., Phillipsburg, N. J.
Belmont Smelting & Refining Works, Inc., 330 Belmont Ave., Brooklyn, N. Y.
Cerro de Pasco Copper Corp., 40 Wall St., New York 5, N. Y.
Merck & Co., Inc., Rahway, N. J.
Mallinckrodt Chemical Works, St. Louis, Mo.
Neo Smelting & Refining Co., 29 Broadway, New York 6, N. Y.
Philipp Bros., Inc., 70 Pine St., New York, N. Y.
Varlacoid Chemical Co., 116 Broad St., New York, N. Y.

CADMIUM

American Metal Co., Ltd., Duquesne Division, Pittsburgh, Pa.
American Smelting, Refining & Mining Co., Fairfield, Utah.
Ananconda Copper Mining Company, 25 Broadway, New York 4, N. Y.
Belmont Smelting & Rfg. Works, Inc., Brooklyn, N. Y.
Duquesne Smelting Corp., Pittsburgh, Pa.
Federated Metals Div., American Smelting & Rfg. Co., New York, N. Y.
Harshaw Chemical Company, 1945 East 97th St., Cleveland 6, Ohio.
Metal Traders, Inc., New York, N. Y.
Mid-American Non Ferrous Metal Co., Chicago, Ill.
North American Smelting Co. Inc., Philadelphia, Pa.
Philipp Brothers, Inc., 70 Pine St., New York, N. Y.

C. Tennant, Sons & Company, of New York, Empire State Bldg., New York 1, N. Y.
United States Smelting & Refining Company, 75 Federal St., Boston, Mass.

CHROME ORE
(Metallurgical Ore Users)

Electro-Metallurgical Sales Corp., 30 E. 42nd St., New York 17, N. Y.
Ohio Ferro-Alloys Corp., Canton 2, Ohio
Pittsburgh Metallurgical Co., Niagara Falls, N. Y.
Rustless Iron & Steel Division of the Armco Steel Corp., 3400 E. Chase St., Baltimore 13, Md.
Vanadium Corporation of America, 420 Lexington Ave., New York 17, N. Y.

(Chemical Ore Users)

Diamond Alkali Co., 300 Union Commerce Bldg., Cleveland 14, Ohio.
Imperial Paper & Color Corp., Glens Falls, N. Y.
The Martin Dennis Co., 859 Summer Ave., Newark 4, N. J.
Mutual Chemical Co. of America, 270 Madison Ave., New York 16, N.Y.
Natural Products Refining Co., Jersey City 5, N. J.

(Refractory Ore Users)

Allegheny-Ludlum Steel Corp., Brackenridge, Pa.
Basic Refractories, Inc., 845 Hanna Bldg., Cleveland 15, Ohio.
Bradley & Ekstrom, 320 Market St., San Francisco, Calif.
Botfield Refractories Co., 777 S. Swanson St., Philadelphia 47, Pa.
Carnegie Steel Co., Carnegie Bldg., Pittsburgh, Pa.
Foote Mineral Co., Inc., 18 W. Chelten Ave., Philadelphia 44, Pa.
General Refractories Co., Broad and Chestnut Sts., Philadelphia 7, Pa.
Harbison-Walker Refractories Co., Farmers Bank Bldg., Pittsburgh 22, Pa.
E. J. Lavino & Co., 1528 Walnut St., Philadelphia 2, Pa.

COBALT

Ceramic Color & Chemical Mfg. Co., New Brighton, Pa.
Foote Mineral Co., 18 W. Chelton Ave., Philadelphia 44, Pa.
Harshaw Chemical Co., 1945 East 97th St., Cleveland, Ohio.
Kennametal, Inc., Latrobe, Pa.
The Pyrites Co., Wilmington, Del.
The O. Hommel Co., Carnegie, Pa.
Shepherd Chemical Co., Highland Avenue, Cincinnati, Ohio.

COPPER

American Metal Co., Ltd., Carteret, N. J.
American Smelting & Refining Co., El Paso, Tex, Garfield, Utah, Hayden, Ariz., Perth Amboy, N. J., Tacoma, Wash.
Anaconda Copper Mining Co., Anaconda, Mont.
Inspiration Consolidated Copper Co., Inspiration, Ariz.
International Smelting & Refining Co., Miami, Ariz., Tooele, Utah., Perth Amboy, N. J.
Kennecott Copper Corp., McGill, Neva., Hurley, N. M.
Magma Cooper Co., Superior, Ariz.
Phelps Dodge Refining Corp. Laurel Hill, N. Y.
Phelps Dodge Corp., Douglas, Ariz., Morenci, Ariz., Ajo, Ariz.
C. Tennant Sons & Co., Empire State Bldg., New York 1, N. Y.
Tennessee Copper Co., Copperhill, Tenn.

DIATOMITE

American Cyanamide Co., 30 Rockefeller Plaza, New York, N. Y.
A. Daigger & Co., 161 West Kinzie St., Chicago, Ill.
General Refractories Co., 1518 Locust St., Philadelphia, Pa.
B. F. Goodrich Co., 440 S. Main St., Akron, Ohio.
Hygeia Filter Co., 3422 Denton St., Detroit.
Industrial Minerals & Chemical Co., 836-38 Gilman St., Berkeley, Calif.
Marshall Dill Division, WhitCo Chemical Co., 30 Bluxome St., San Francisco, Calif.
Miller Products Co., 1932 S W Water Ave., Portland, Ore.
Minerals & Insulation Co., Inc., 240 Webster St., Trenton 4, N. J.
National Battery Co., First Nat'l Bank Bldg., St. Paul, Minn.
National Filter Media Co., Sales Div. of Filter Media Corp., 1719 Dixwell Ave., New Haven, Conn.

GRINDERS OF FELDSPAR

Black Hills Tin Co., Tinton, S. D.
Carolina Mineral Co., Inc., Kena, N. C.
Consolidated Feldspar Corp., Trenton Trust Bldg., Trenton, N. J.
Eureka Mica Mining & Milling Co., Portland, Conn.
Feldspar Milling Co., Burnsville, N. C.
Gladding, McBean & Co., 1919 E. 52nd St., Los Angeles, Calif.
Northern Feldspars Corp., W. Rumney, N. H.
Standard Flint & Spar Corp., 1401 New York Ave., Trenton 7, N. J.
Topsham Feldspar Co., Brunswick, Maine.
United Feldspar & Minerals Corp., Minpro Div., Spruce Pine, N. C.
Western Feldspar Milling Co., 1333 W. Maple Ave., Denver, Colo.

FLUORSPAR
(Brokers or Selling Agents)

Balfour, Guthrie, & Co., Los Angeles, Calif.
Bauer-Wilson & Bateman, 138 S. LaSalle St., Chicago, Ill.
Continental Ore Co., 500 Fifth Ave., New York City.
E. I. du Pont de Nemours & Co., 1007 Market St., Wilmington, Del.
Foote Mineral Co., 18 W. Chelten Ave., Philadelphia 44, Pa.
Hickman, Williams & Co., Clark Bldg., Pittsburgh, Pa.
Kerchner, Marshall & Co., Oliver Bldg., Pittsburgh, Pa.
E. J. Lavino & Co., 1528 Walnut St., Philadelphia, Pa.
Mercantile Import & Export Corp., 21 East 40th St., New York City.
Mercantile Metal & Ore Corp., 60 Wall St., New York City.
Miller-Adick Co., Carew Tower, Cincinnati, O.
Wm. H. Muller & Co., Inc., 122 East 42nd St., New York City.
Oglebay Norton & Co., Hanna Bldg., Cleveland, O.
Frank Samuel & Co., Lincoln-Liberty Bldg., Philadelphia, Pa.
Sussex Trading Corp., 1 Newark Ave., Jersey City, N. J.
Tomlinson & Co., 1500 Walnut St., Philadelphia, Pa.

Note: Purchases direct from producers are made in a great many instances by the following types of industries: **Acid Spar**—aluminum reduction works, certain chemical manufacturers. **Ceramic grade**—pottery, glass and dishware plants. **Metallurgical grade**—ferroalloy producers, steel mills, foundries, cement plants, etc.

GRAPHITE

Asbury Graphite Mills, Asbury, N. J.
Hill and Griffith Co., Cincinnati, O.
Pacific Graphite Works, Oakland, Cal.
Ray-O-Vac Co., Madison, Wis.

IRON ORE

Armco Steel Corp., Middleton, Ohio.
Bethlehem Steel Company, Bethlehem, Pa.
Chester Blast Furnace, Inc., Chester, Pa.
Colorado Fuel & Iron Corp., Pueblo, Colorado.
Crucible Steel Co. of America, 405 Lexington Ave., New York, N. Y.
Detroit Steel Corp., Portsmouth, Ohio
Eastern Gas and Fuel Ass'n., 250 Stewart Bldg., Boston, Mass.
Ford Motor Company, Detroit, Mich.
Granite City Steel Co., Box 367, Granite City, Ill.
Hanna Furnace Corp., Grant Bldg., Chicago 3, Ill.
Inland Steel Co., 38 S. Dearborn St., Chicago 3, Ill.
Interlake Iron Corp., 1900 Union Commerce Bldg., Cleveland 14, Ohio.
International Harvester Co., 180 No. Michigan Ave., Chicago 1, Ill.
Jones & Laughlin Steel Corp., 3rd Ave. and Ross St., Pittsburgh 30, Pa.
Kaiser Company, Inc., Fontana, Calif.
Lone Star Steel Co., Lone Star Texas
National Steel Corp., 2800 Grant Bldg., Pittsburgh, Pa.
Newport Steel Corp., Newport Kentucky.
Pittsburgh Coke and Chemical Co., 1802 Grant Ave., Pittsburgh, Pa.
Pittsburgh Steel Co., P. O. Box 118, Pittsburgh 30, Pa.
Republic Steel Corp., Republic Bldg., 25 Prospect Ave., N. W. Cleveland 1, Ohio
Sharon Steel Corp., Sharon, Pa.
Sloss-Sheffield Steel & Iron Co., Birmingham, Ala.
Tennessee Coal, Iron and Railway Co., Brown-Marx Bldg., Birmingham, Ala.
Tennessee Products & Chemical Corp., 404 Amn. Nat'l Bank Bldg., Nashville, Tenn.
Weirton Steel Co., Grant Bldg., Pittsburgh, Pa.
Wheeling Steel Corp., Wheeling, West Virginia.
Woodward Iron Company, Woodward, Ala.
Youngstown Sheet & Tube Co., Stambaugh Bldg., Youngstown 1, Ohio.

LEAD

American Metal Company, Ltd., 61 Broadway, New York 6, N. Y.
American Smelting & Refining Co., 120 Broadway, New York 5, N. Y.
Bunker Hill & Sullivan Mining & Concentrating Co., Kellogg, Idaho.
The Consolidated Mining & Smelting Co., Ltd., Montreal, Canada.
The Eagle-Picher Co., Cincinnati 1, Ohio American Building).
International Smelting & Refining Co., 25 Broadway, New York 4, N. Y.

Metal Traders, Inc., 67 Wall St., New York, N. Y.
National Lead Company, 111 Broadway, New York, N. Y.
Philipp Brothers, Inc., 70 Pine St., New York 5 N. Y.
St. Joseph Lead Co., 250 Park Ave., New York 17, N. Y.
C. Tennant, Sons & Co., Empire State Bldg., New York 1, N. Y.
United States Smelting, Refining & Mining Co., 75 Federal St., Boston, Mass.

LEPIDOLITE

Corning Glass Works, Corning, N. Y.
General Electric Co., Nela Park, Cleveland, Ohio.
Foote Mineral Co., 18 W. Chelten St., Philadelphia 44, Pa.
Pittsburgh Corning Corp., Port Allegany, Pa.

LITHIUM

Foote Mineral Co., Chelten Ave., Philadelphia 44, Pennsylvania.
General Electric Co., 1 River Road, Bldg. No. 59, Schenectady, New York
Harshaw Chemical Co., 18 W. 97th St., Cleveland, Ohio.
Maywood Chemical Works, Maywood, New Jersey.
Metalloy Corp., 1320 Rand Tower, Minneapolis, Minnesota.
Westinghouse Electric & Mfg. Co., Lamp Division, Fairmount, West Virginia.

MAGNESITE

Following is an incomplete list of firms operating basic open-hearth steel furnaces that use dead-burned magnesia. Not all of the branch plants of the larger firms are listed, and many firms that operate only a few hearths are not listed at all.

Alan Wood Steel Co., Conshohocken, Pa. (Hearths at Ivy Rock, Pa.)
Allegheny Ludlum Steel Co., Pittsburgh, Pa. (Hearths at Brackenridge, Pa.)
American Rolling Mill Co., Middleton, Ohio (Hearths at Ashland, Ky., and St. Louis, Mo.).
Bethlehem Steel Co., Bethlehem, Pa. (Hearths at Sparrows Point, Md.; Lackawanna, N. Y.; Bethlehem, Pa.; Johnstown, Pa.; Steelton, Pa.; and Seattle, Wash.).
Carnegie-Illinois Steel Corporation, Pittsburgh, Pa. (Hearths at Clairton, Pa.; Munhall, Pa.; Braddock, Pa.; and Duquesne, Pa.)
Colorado Fuel & Iron Corporation, Pueblo, Colo.
Columbia Steel Co., San Francisco, Calif. (Hearths at Pittsburgh, Calif.)
Inland Steel Co., Indiana Harbor, Ind.
Jones & Laughlin Steel Corporation, Pittsburgh, Pa.
Kaiser Co., Inc., Fontana, Calif.
Lukens Steel Co., Coatesville, Pa.
National Steel Co., Pittsburgh, Pa. (Hearths at Weirton, W. Va.)
National Tube Corporation, Pittsburgh, Pa. (Hearths at Lorain, Ohio.)
Pittsburgh Steel Co., Pittsburgh, Pa. (Hearths at Monessen, Pa.)
Republic Steel Corporation, Cleveland, Ohio. (Hearths at Chicago, Ill.; Cleveland, Ohio; Youngstown, Ohio; and Canton, Ohio).
Tennessee Coal, Iron & Railroad Co., Birmingham, Ala. (Hearths at Fairfield, Ala.)
Wheeling Steel Corporation, Wheeling, W. Va. (Hearths at Steubenville, Ohio, and Portsmouth, Ohio).

The following producers of basic refractories are also possible purchasers of dead-burned magnesia:

Basic Refractories, Inc., 845 Hanna Bldg., Cleveland 15, Ohio.
General Refractories Co., 1600 Real Estate Trust Bldg., Philadelphia 7, Pa.
Harbison-Walker Refractories Co., 1800 Farmers Bank Bldg., Pittsburgh, Pa.

(*Possible buyers of caustic-calcined material*)

Armour Fertilizer Works, 816 Walton Bldg., Atlanta, Ga.
Consolidated Tile & Deck Coverings, 101 Park Ave., New York 17, N. Y.
Dow Chemical Co., Midland, Mich.
Electro-Metallurgical Co., 30 E. 42nd St., New York 17, N. Y.
General Electric Co., 1 River Road, Schenectady, N. Y.
Goodyear Tire & Rubber Co., 1144 E. Market St., Akron 16, Ohio.
Hill Brothers Chemical Co., 2159 Bay St., Los Angeles 21, Calif.
Norton Co., 1 New Bond St., Worcester 6, Mass.
F. E. Schundler & Co., Inc., 504 Railroad St., Joliet, Ill.
Westvaco Chlorine Products Corporation, 405 Lexington Ave., New York, N. Y.

MAGNESITE AND BRUCITE

Basic Refractories, Inc., 845 Hanna Bldg., Cleveland 15, Ohio.
General Magnesite & Magnesia Co., 705 Architects Bldg., Philadelphia 3, Pa.
Kaiser Aluminum & Chemical Corp., Kaiser Bldg., Oakland 12, Calif.
Northwest Magnesite Co., 1800 Farmers Bank Bldg., Pittsburgh 22, Pa.
The Paraffine Cos., Inc., 1550 Powell St., Emeryville 8, Calif.
Westvaco Chroline Products Corp., 405 Lexington Ave., New York 17, N. Y.

MANGANESE ORE

(*Consumers of Metallurgical-grade Manganese Ore*)

American Steel Foundries, 410 N. Michigan Ave., Chicago, Ill.
Bethlehem Steel Co., Bethlehem, Pa.
Carnegie-Illinois Steel Corp., 436 Seventh Ave., Pittsburgh 30, Pa.
Colorado Fuel & Iron Corp., Pueblo, Colo.
Continental Steel Co., 1109 S. Main St., Kokomo, Ind.
Electro Manganese Corp., Knoxville, Tenn.
Kaiser Steel Co., Fontana, Calif.
Lincoln Electric Co., 12818 Coit Road, Cleveland, Ohio
Lone Star Steel Co., Lone Star, Texas
Pittsburgh Metallurgical Co., Niagara Falls, New York
Sheffield Steel Corp., Kansas City, Mo.
Sloss-Sheffield Steel & Iron Co., Birmingham, Ala.
Tennessee Products & Chemical Corp., American National Bank Bldg., Nashville, Tenn.
Woodward Iron Co., Woodward, Alabama

(*Consumers of Battery and Chemical-grade Manganese Ores*)

Acme Battery Co., 59 Pearl St., Brooklyn, N. Y.
Anchor Hocking Glass Corp., 409 N. Broad St., Lancaster, Ohio
Arcrods, Inc., P. O. Box 6686, Sparrows Point, Ind.
Bradley & Ekstrom, 320 Market St., San Francisco, Calif.
Burgess Battery Company, Freeport, Ill.
Foote Mineral Co., 10 E. Chelten Ave., Philadelphia 44, Pa.
General Dry Batteries, Inc., Cleveland, Ohio.
General Electric Co., Mela Park, Cleveland, Ohio
E. J. Lavino & Company, 1528 Walnut St., Philadelphia 2, Pa.
Lincoln Electric Co., 12818 Coit Road, Cleveland, Ohio
Merck & Co., Inc., Lincoln Ave., Rahway N. J.
National Paint & Manganese Co., Lynchburg, Va.
Ray-O-Vac Company, Madison, Wis.
C. Tennant, Sons & Co., Empire State Bldg., New York 1, N. Y.
Tennessee Eastman Corp., Kingsport, Tenn.
Union Carbide & Carbon Corp., 30 East 42nd St., New York, N. Y.
U. S. Electric Mfg. Corp., 222 West 14th St., New York 11, N. Y.
Verona Chemical Co., 26 Vernon Ave., Newark, New Jersey
Winchester Repeating Arms Co., New Haven 4, Conn.

MERCURY

Allied Chemical & Dye Corp., The Solvay Process Div., P. O. Box 271, Syracuse, N. Y.
American Cyanamid Co., General Explosives Div., 20 Rockefeller Plaza, New York 20, N. Y.
American Meter Co., Erie, Pa.
Automatic Steel Products, Inc., Mercury Clutch Div., 1201 Camden Ave., S. W., Canton 6, Ohio.
Bailey Meter Co., 1052 Ivanhoe Rd., Cleveland 10, Ohio.
J. T. Baker Chemical Co., Phillipsburg, N. J.
F. W. Berk & Co., Inc., Woodridge Div., Box 38, Woodridge, N. J.; Coast Chem. Div., 55 New Montgomery St. San Francisco, Cal.
L. D. Caulk, Milford, Del.
E. I. du Pont de Nemours & Co., Inc., Methods Div., Du Pont Bldg., Wilmington 93, Del.
Foxboro Co., Foxboro, Mass.
General Aniline & Film Corp., General Aniline Works Div., 435 Hudson St., New York 14, N. Y.
General Color Co., 24 Avenue B, Newark 5, N. J.
General Electric Co., Purchasing Dept., 1 River Road, Schenectady 5, N. Y.
Mallinckrodt Chemical Works, Jersey City 5, N. J.
Mathieson Chemical Corp., 60 E. 42nd St., New York 17, N. Y.
Merck & Co., Inc., Lincoln Ave., Rahway, N. J.
The Mercoid Corp., 4201 Belmont Ave., Chicago 41, Ill.
Metalsalts Corp., 200 Wagaraw Rd., Hawthorne, N. J.
Minneapolis Honeywell Regulator Co., 2753 4th Ave. S., Minneapolis 8, Minn.; Brown Instrument Div., 4331 Wayne Ave., Philadelphia, Pa.
Nepera Chemical Co., Inc., Yonkers 2, N. Y.
Phillips Petroleum Co. Bartlesville, Okla.
Public Service Electric & Gas Co., Electric Dept., 80 Park Place, Newark 1, N. J.
Quicksilver Producers Association, 407 Sansome St., San Francisco 11, Calif.
Thomas A. Edison, Inc., Primary Battery Div., Bloomfield, N. J.
Union Carbide & Carbon Corp., 30 E. 42nd St., New York, N. Y.
U. S. Vanadium Corp., Niacet Chemicals Div., Box 807 Niagara Falls, N. Y.
Westinghouse Electric Corp., 306 Fourth Ave., Pittsburgh 30, N. J.
Wyandotte Chemical Corp., Wyandotte, Mich.

MICA

The American Electrical Heater Co., 6110 Cass Ave., Detroit, Mich.
Ford Radio & Mica Corp., 536 63rd St., Brooklyn, N. Y.
General Electric Co., 1 River Rd., Schenectady 5, N. Y.
Huse-Libery Mica Co., 177 Camden St., Boston, Mass.
Industrial Mica Corp., 945 61st St., Brooklyn, N. Y.
New England Mica Co., 66 Woerd Ave., Waltham, Mass.
Perfection Mica Co., 2400 W. Madison St., Chicago, Ill.
Reliance Mica Co. 341 39th St., Brooklyn, N. Y.
Spruce Pine Mica Inc., Spruce Pine, N. C.
Sylvania Electric Products Inc., Emporium, Penn.
Victor Mica Mfg. Co., 1078 Atlantic Ave., Brooklyn 16, N. Y.

MICA GRINDERS

(*Buyers of Domestic Scrap Mica*)

Asheville Mica Co., Biltomore, N. C.-Dry
Concord Mica Corp., 25 Chestnut St., Penacook, N. H.-Wet
Deneen Mica Co., Erwin, Tenn.-Dry
Franklin Mineral Products Co., Franklin, N. C.-Wet and Dry
Richmond Mica Corp., 900 Jefferson Ave., Newnort News, Va.-Wet
Sunshine Mica Div., Pumice Corp. of America, Grants, N. M.-Dry
Thompson-Weinman, Cartersville, Ga.-Dry
U. S. Mica Co., Inc. Stamford, Conn-Dry
Western Nonmetallics, Inc., Pueblo, Colo.-Dry

MOLYBDENUM CONCENTRATES

J. T. Baker Chemical Co., Phillipsburg, N. J.
Electro Metallurgical Div., Niagara Falls, N. Y.
Climax Molybdenum Co., 500 Fifth Ave., New York, N. Y.
Molybdenum Corp. of America, 500 Fifth Ave., New York, N. Y.
Republic Steel Corp., Canton, Ohio
S. W. Shattuck Chemical Co., Denver, Colo.

NICKEL

American Smelting & Refining Co., 120 Broadway, New York, N. Y.
Cosmo Metal Alloys Co., 275 Front St., New York, N. Y.
J. A. Samuel & Co., 220 Broadway, New York, N. Y.
Sulmet Alloys Co., Inc., Wellington St. and Erie R.R., Clifton, N. J.
United States Smelting, Refining & Mining Co., 1 State St., Boston, Mass.

PERLITE

AiResearch Mfg. Co., Los Angeles, Calif.
AleXitE Engineering Co., Colorado Springs, Colo.
Chapman & Wood, Lincoln Building, Albuquerque, New Mexico.
Dant & Russell, Inc., Dantmore Div., St. Helena, Ore.
W. D. Evans, Phoenix, Arizona.
Goodyear Farms, Litchfield Park, Ariz.
Greggco Plaster Aggregate, Gregg Products Co., 550 Oakdale St., S. E. Grand Rapids 7, Mich.
Hancock Plastering Co., Mesa, Ariz.

Richard Kiessling, Phoenix, Ariz.
Elliott Long, Ray, Ariz.
Pacific Ryolex Corp., 3941 Goodwin Ave., Los Angeles 26, Calif.
Perlite Mfg. Co., Carnegie, Pa.
Rhodes & Reynolds, Phoenix, Ariz.
U. S. Gypsum Co., 300 W. Adams Street, Chicago 6, Ill.
Utah Pumice & Perlite Co., Inc., Salt Lake City, Utah.
R. L. Watson, Phoenix, Ariz.
Wilson Research Engineering & Exploration Co., Box 14, Veyo, Utah.

PLATINUM

The American Platinum Works, 225 New Jersey R. R. Ave., Newark 5, N. J.
Baker & Co., Inc., 113 Astor St., Newark 5, N. J.
Sigmund Cohn & Co., 44 Gold St., New York 7, N. Y.
Goldsmith Bros. Smelting & Refining Co., 58 E. Washington St., Chicago 36, Ill.
Handy & Harman, 82 Fulton St., New York 7, N. Y.
Johnson, Matthey & Co., Inc., 608 Fifth Ave., New York 20, N. Y.
Kastenhuber & Lehrfeld, Inc., 21 West 46th St., New York 19, N. Y.
Montana Assay Office, 610 S.W. 2nd Ave., Portland 4, Ore.
Pacific Platinum Works, 253 S. Broadway, Los Angeles 12, Calif.
J. A. Samuel & Co., 220 Broadway, New York 7, N. Y.
Wildberg Bros. Smelting & Refining Co., 742 Market St., San Francisco 2, Calif.
Western Gold & Platinum Works, 589 Bryant St., San Francisco 7, Calif.

PYRITE

American Smelting & Refining Co., 120 Broadway, New York 5, N. Y.
Anaconda Copper Mining Co., 25 Broadway, New York 4, N. Y.
Baugh Chemical Company, Baltimore, Maryland.
Davidson Chemical Corporation, 20 Hopkins Place, Baltimore 3, Maryland.
Foote Mineral Company, 18 West Chelten Ave., Philadelphia 44, Pa.
General Chemical Division, Allied Chemical & Dye Corp., P. O. Box 4040, Denver, Colorado.
Norton Company, Worcester, Massachusetts.
Owens Illinois Glass Company, Streator, Illinois.
Reliance Phosphate Company, Savannah, Georgia.
Stauffer Chemical Company, 636 California St., San Francisco 8, Calif.

QUARTZ

(*Consumer of Radio-Grade*)

Bendix Radio, Div. of Bendix Aviation Corp., Baltimore 4, Md.
Breon Labs., 520 Evergreen Rd., Williamsport, Pa.
Commercial Equipment Co., 112 W. 18th St., Kansas City 8, Mo.
Crystal Research Laboratories, 29 Allyn St., Hartford, Conn.
Dallons Laboratories, 5066 Santa Monica Blvd., Los Angeles 27, Calif.
Federal Telephone & Radio Corp., 100 Kingland Rd., Clifton, N. J.
General Electric Co., Electronics Dept., Syracuse, N. Y.
The Hunt Corp., 435 Lincoln St., Carlisle, Pa.
Kaar Engineering Co., 619 Emerson St., Palo Alto, Calif.
August E. Miller, 9226 Hudson Blvd., North Bergen, N. J.
Monitor Piezo Products Co., 815 Fremont Ave., South Pasadena, Calif.
Peterson Radio Co., Inc., 2800 W. Broadway, Council Bluffs, Iowa.
Premier Crystal Laboratories, Inc., 63 Park Row, New York 7, N. Y.
RCA Victor Div. of Radio Corp. of America, Front and Cooper Sts., Camden, N. J.
Standard Piezo Co., 127 Cedar St., Carlisle, Pa.
Valpey Crystal Corp., 1244 Highland St., Holliston, Mass.
V. Precision Instrument Co., 57-02 Hoffman Dr., Elmhurst, N. Y.
Western Electric Company, Inc., 195 Broadway, New York 7, N. Y.

RARE-EARTH ORES

(*Cerium ores, monazite sand, bastnaesite, other thorium-bearing ores*)

Lindsay Light & Chemical Co., West Chicago, Illinois.
Maywood Chemical Works, Maywood, N. J.
Rare Earths, Inc., R. D. #1, Paterson, N. J.

SPODUMENE

Corning Glass Works, Corning, N. Y.
Foote Mineral Co., 12 E. Chelten Ave., Philadelphia 44, Pa.
Maywood Chemical Works, Maywood, N. J.
Metalloy Corp., 1320 Rand Tower, Minneapolis, Minn.
National Enameling and Stamping Co., 270 N. 12th St., Milwaukee, Wis.
Owens Corning Fiberglas Corp., Newark, Ohio.

STRONTIUM ORES

Associated Metals & Minerals Corp., 40 Rector St., New York, N. Y.
J. T. Baker Chemical Co., Phillipsburg, N. J.
Barium Products, Ltd., Modesto, Calif.
Barium Reduction Corp., Charleston, W. Va.
E. I. du Pont de Nemours & Co., Inc., 11th & Orange Sts., Wilmington, Del.
Foote Mineral Co., Inc., 12 E. Chelten Ave., Philadelphia, Pa. (minerals).
General Electric Co., 1 River Road, Schenectady, N. Y.
Chas. Hardy, 415 Lexington Ave., New York, N. Y.
Harshaw Chemical Co., 1933 E. 97th St., Cleveland, Ohio.
Hummel Chemical Co., 90 West St., New York, N. Y.
Jungman & Co., 157 Chambers St., New York, N. Y.
J. A. Samuel & Co., 220 Broadway, New York, N. Y.

TANTALITE AND COLUMBITE

Tantalite—Fansteel Metallurgical Corp., North Chicago, Ill.
Columbite—Electro Metallurgical Co., 30 E. 42nd St., New York 17, N. Y.

TIN

American Smelting and Refining Co., 120 Broadway, New York 5, N. Y.
Metal & Thermit Corp., 120 Broadway, New York 5, N. Y.
Reconstruction Finance Corp., Office of Metals Reserve, 811 Vermont Ave., Washington 25, D. C.
C. Tennant, Sons & Co., Empire State Bldg., New York 1, N. Y.
Vulcan Detinning Co., Sewaren, N. J.

TITANIUM MINERALS

(*Ilmenite—Pigment Manufacturers*)

American Cyanamid Co., Calco Chemical Div., Eastern Turnpike, Bound Brook, N. J.
The Chemical & Pigment Co., 6401 St. Helena Ave., Baltimore 22, Md.
E. I. du Pont de Nemours & Co., Inc., Methods Div., Du Pont Bldg., Wilmington 98, Del.
National Lead Co., 111 Broadway, New York 6, N. Y.

(*Ilmenite & Rutile—Welding Rod Manufacturers*)

Actarc, Inc., P. O. Box 168, Bedford, Ohio.
American Brake Shoe Co., 230 Park Ave., New York 17, N. Y.
Arcos Corp., 1500 So. 50th St., Philadelphia 43, Pa.
Arcrods Corp., 60 E. 42nd St., New York 17, N. Y.
Champion Rivet Co., 10931 Harvard Ave., Cleveland 15, Ohio.
Harnischfeger Corp., 4400 W. National St., Milwaukee, Wisc.
Hollup Corp., 4700 W. 19th St., Chicago 50, Ill.
R. G. LeTourneau, Inc., Peoria, Ill.
Shober Sales Co., 900 W. Weber Ave., Stockton, Calif.
A. O. Smith Corp., 3533 N. 27th St., Milwaukee 1, Wisc.
Stoody Co., Whittier, Calif.
Westinghouse Electric Corp., 306 Fourth Ave., Pittsburgh, Pa.

(*Ilmenite & Rutile—Alloy Manufacturers*)

Aluminum Co. of America, 1200 Ring Bldg., Washington 6, D. C.
Metal & Thermit Corp., 120 Broadway, New York 5, N. Y.
Titanium Alloy Mfg., Div. National Lead Co., 111 Broadway, New York 6, N. Y.
Union Carbide & Carbon Corp., 30 East 42nd St., New York 17, N. Y.
Vanadium Corp. of America, 420 Lexington Ave., New York 17, N. Y.

(*Rutile Dealers*)

Berkshire Chemicals, Inc., 420 Lexington Ave., New York 17, N. Y.
L. H. Butcher Co., 3628 E. Olympic Blvd., Los Angeles 23, Calif.
Foote Mineral Co., 18 W. Chelten Ave., Philadelphia 44, Penna.
International Titanium Corp., 111 Broadway, New York 6, N. Y.
Metal Traders, Inc., 67 Wall St., New York 5, N. Y.
Orefraction Inc., 7425 Thomas St., Pittsburgh 8, Penna.
C. Tennant Sons & Co., of New York, Empire State Bldg., New York 1, N. Y.

TUNGSTEN CONCENTRATES

Bishop Concentrate & Cleaning Co., Bishop, California.
Braeburn Alloy Steel Co., Div. of Continental Copper & Steel Ind., Inc., Braeburn, Pennsylvania.
Columbia Tool Steel Company, Chicago Heights, Illinois.
Crucible Steel Company of America, 405 Lexington Avenue, New York, N. Y.
E. Fernstrom, 648 West 3rd Street, Tucson, Arizona.
Ferro Corporation, 4150 East 56th Street, Cleveland, Ohio.
Firth Sterling Steel & Carbide Corp., McKeesport, Pennsylvania.
Foote Mineral Company, 18 West Chelten Avenue, Philadelphia, Pa.
General Electric Company, Cleveland Wire Works, Lamp Dept., 1331 Chardon Road, Euclid 17, Ohio.
Jessop Steel Company, Washington, Pennsylvania.
Kennametal, Inc., Latrobe, Pa.
Latrobe Electric Steel Company, Latrobe, Pa.
Molybdenum Corp. of America, 500 Fifth Avenue, New York, N. Y.
Shattuck Chemical Company, 1805 So. Bannock Street, Denver, Colo.
Sunset Tungsten Mines, Bishop, California.
Sylvania Electric Products Co., Tungsten & Chemical Division, Box 70, Towanda, Pennsylvania.
U. S. Vanadium Company, Div. of Union Carbide & Carbon Corp., 30 E. 42nd Street, New York, N. Y.
Vanadium Alloy Steel Company, Latrobe, Pa.
Vulcan Crucible Steel Company, Aliquippa, Pennsylvania.
Wah Chang Corporation, Woolworth Building, New York 7, N. Y.
Westinghouse Electric Corp., 1-71 MacArthur Avenue, Bloomfield, N. J.

URANIUM-VANADIUM ORES

Atomic Energy Commission, Ore Purchasing Depot, Monticello, Utah, or Marysvale, Utah, and Shiprock or Grants, N. M.
Climax Uranium Co., Grand Junction, Colo.
U. S. Vanadium Co., Rifle, Colo. or Uravan, Colo.
Vanadium Corp. of America, Durango, Colo., Naturita, Colo., and Hite, Utah.
Vitro Chemical Co., 600 W. 33rd St., Salt Lake City, Utah.

ZINC

The American Metal Co., Ltd., 61 Broadway, New York 6, N. Y.
American Smelting & Refining Co., 120 Broadway, New York 5, N. Y.
American Zinc Co. of Illinois, 1600 Paul Brown Bldg., St. Louis, Mo.
Anaconda Copper Mining Co., 25 Broadway, New York 4, N. Y.
Associated Metals & Minerals Corp., 75 West St., New York 6, N. Y.
Athletic Mining & Smelting Co., Fort Smith, Ark.
E. I. du Pont de Nemours & Co., 1007 Market St., Wilmington 98, Del.
Eagle-Picher Co., American Bldg., Cincinnati 1, Ohio.
Eagle-Picher Mining & Smelting Co., Miami, Okla.
W. R. Grace & Company, Hanover Square, New York, N. Y.
The Hegler Zinc Company, Danville, Ill.
International Minerals & Metals Corp., 11 Broadway, New York 4, N. Y.
Matthiessen & Hegeler Zinc Co., La Salle, Ill.
Metal Traders, Inc., 67 Wall St., New York, N. Y.
New Jersey Zinc Co., 160 Front St., New York 7, N. Y.
Philipp Brothers, Inc., 70 Pine Street, New York 5, N. Y.
St. Joseph Lead Co., 250 Park Ave., New York 17, N. Y.
The Sherwin-Williams Co., Ozark Smelting & Mining Division, 101 Prospect Ave., N.W., Cleveland 1, Ohio.
Sullivan Mining Co., Box 209, Kellogg, Idaho.
C. Tennant, Sons & Co., Empire State Bldg., New York 1, N. Y.
U. S. Steel Corp., 436 Seventh Ave., Pittsburgh 30, Pa.
United Zinc Smelting Corp., 50 Union Square, New York 3, N. Y.

ZIRCON

F. W. Berk & Co., Woodridge, N. J.
Cohart Refractories Co., Louisville, Ky.
Electro Metallurgical Div., Union Carbide & Carbon Corp., 30 E. 42nd St., New York 17, N. Y.
Foote Mineral Co., 18 W. Chelten Ave., Philadelphia 44, Pa.
International Titanium Corp., 120 Broadway, New York 5, N. Y.
Orefraction, Inc., 7505 Meade St., Pittsburgh, Pa.
Titanium Alloy Mfg. Div., National Lead Co., 111 Broadway, New York 6, N. Y.

DIRECTORY

United States Mining Operations

ALASKA

To provide the greatest possible utility, this list of American mining properties is presented alphabetically by states. Listings are made under the name of the operating company, the mine or the individual operator, depending upon the name under which the property is operated or commonly known.

Totally inactive properties offering no indication of an early resumption of operation have been deleted.

The list was compiled after a careful survey of some 6,000 mines and prospects, both active and dormant, in the United States and Alaska. Questionnaire forms covering major operating details and personnel were mailed over a period of three months. Where information supplied by the operator or owner was not complete, supplementary data were obtained from MINING WORLD field reports compiled by staff members in the course of nearly a half-million miles of mine-to-mine travel during the past few years and from records furnished by federal and state mining agencies.

While MINING WORLD cannot guarantee 100 percent accuracy of this directory, it believes the list is the best obtainable from any source.

A & S MINING CO
Fairbanks
PLACER on Crevice Cr, Koyuk dist
Au

ADAMIK, MARTIN
Coal Creek
BOULDER ASSOCIATION on Boulder Cr, Hydraulic, stream gravel, Au

ADMIRALTY-ALASKA GOLD MINING CO, Box 529, Juneau
Pres: Henry Raden
VP: L P Dawes
Gen Mgr: W S Pekovich
MINE at Funter, undergroung, Au, Ag, Cu, Ni, Co
Cons Engr: N C Steris
100-TON GRAV FLOT MILL
Supt: G W Powell
Under dev

ALAMCO, INC
Fairbanks
BOULDER CR LODE, Tok dist, Sb
SAWTOOTH MT LODE, Rampart dist, Sb
SMITH CR LODE, Koyukuk dist, Sb

ALASKA EMPIRE GOLD MINING CO, Box 529, Juneau
Pres: N C Stines
VP: Dr L P Dawes
Dir: V B Walider
Gen Mgr: W S Pekovich
MINE at Hawk Inlet, underground, Au, Ag
100-TON GRAV FLOT MILL
Met: G W Powell
Under dev

ALASKA EXPLORATION & MINING CO, LTD
Box 136, Pullman, Wash
Pres: W C Moys
Sec Treas: J E McCoy
Mgr: Mike A Trepte
BIRD CR MINE near Talkeetna, hydraulic placer, Au
TIMBERLINE MINE near Cantwell, Au
Under dev

ALASKA GOLD MOUNTAIN MINES, LTD, 714 Garfield Bldg, Los Angeles, Calif
Pres: Charles F Hutchins
MINE at Ketchikan, Au, Ag
35-TON MILL

ALASKA JUNEAU GOLD MNG CO, 1022 Crocker Bldg, San Francisco, Calif
Pres: C A Norris
VPs: Worthern Bradley, P R Bradley, Jr
Sec Treas: D L Feathers
MINE at Juneau, underground, Au, Ag, Pb
14,000-TON GRAV FLOT MILL
Gen Mgr: J A Williams
Asst Gen Mgr: E G Nelson
Met: H W Coke
Purch Agt: Northwest Lead Co
Idle

ALASKA LUCKY STRIKE INC
Cordova
Pres & Gen Mgr: W H Chase
Sec: I D Bogart
16 CLAIMS, McKinley Lake dist, 22 mi E of Cordova, underground
50-TON GRAV MILL, Kennedy Ball
SMELTER

ALASKA PACIFIC CONS MNG CO, 609 Coleman Bldg, Seattle Wash
Pres: V A Montgomery
Sec Treas: E W Wardin
INDEPENDENCE MINE, Wasilla, underground, Au, Ag
100-TON BALL MILL
Idle

ALASKA PLACER CO
327 Colman Bldg, Seattle, Wash
Pres & Gen Mgr: Ralph Lomen
VP: C J Lomen
Sec Treas: E P Wood
PLACER MINE on Niukluk River, 2 1/2-ft dredge, Au
Supt: Charles Gustafson

ALDER CREEK MINING CO
Box 1999, Fairbanks
Partner: N E Sather
Mgr: J P Drabies
HYDRAULIC PLACER on Fairbanks Creek, Au

ALLUVIAL GOLDS, INC
4556 University Way, Seattle, Wash
Pres & G n Mgr: Ernest N Patty
Dirs: Walter Seligman, E D Bull, Mrs A D McRae
MINE on Woodchopper Cr, P O Fairbanks, 4-ft dredge, Au

AMERICAN CREEK EXPLORATION CO, Nanek
Pres & Gen Mgr: Bill Hammersly
AMERICAN CREEK MINE, placer
Au, Ag

AMERO, A W
Chandlar
NUMBER 2 above Upper Discovery on Big Cr, placer, Au

AMUND, OTTO
Eagle
HYDRAULIC PLACER on Fox Creek
Eagle dist, Au

AMY CREEK MINING CO
Box 870, Fairbanks
Mgr: C M Wells
PLACER MINE on Amy Creek, Tolovana dist, dragline-dozer, Au

ANDERSON, EDWARD
Nome
PLACER on Laredo Creek, Nome dist, Au

ANDERSON, ELLIS
Fairbanks
TOBIN CR PLACER, Chandlar dist

ANDERSON, HARRY
18226 42nd Ave S, Seattle 68, Wash
MINE in Chandlar dist

ANDERSON, TURY
Fairbanks
BULLDOZER HYDRAULIC placer on Sumner Creek, Au

ANDUR, LUCCHESI
Jonesville
MINE in Koyukuk dist

ANVIL CREEK MINING CO
Ophir
PLACER GOLD MINE

APOLLO MINING CO
Box 529, Juneau
APOLLO-SITKA-DELADORF CONS
Unga Island, underground, Au, Ag, Cu, Pb, Zn
GRAV MILL
Idle
(Under option to W S Pekovich)

ATLAS MINES
Box 105, Nome
Owner: Geo Waldheim
Engr: Jim Bauyak
ATLAS MINES, 100 mi N of Nome, hydraulic dozer & dragline placer & open pit, Au
500-YD GRAV MILL

ATTWOOD, MERTON J
Chicken
PLACER MINE on Stonehouse Cr, Fortymile dist, placer, Au

AWE MINING CO
Flat
GOLD PLACER MINE near Chicken Cr, 2 draglines, hydraulic dozer, Au, Ag,
Idle

BACKSTROM & PEARSON
Flat
IDAHO MINE on Flat Cr, Iditarod dist, hydraulic placer, Au

BALDWIN & MOON
Haycock
SWEEPSTAKES CR PLACER MINE, Koyuk dist

BARTHOLOMAE CORP
1033 Brea Rd, Fullerton, Calif
Pres & Gen Mgr: W A Bartholomae
GOLD PLACER MINE, Gold Run Cr
Port Clarence
GOLD MINE, Ester Dome, via Fairbanks
Engr: B W Vallat
Idle

BAUER, RICHARD A
Eagle
MINE at Crooked Cr, placer, Au

BAUQUIER, JOHN
Flat
PLACER on Happy Cr, Iditarod dist, Au

BEATON, NEIL
Ophir
PLACER MINE near Ophir, Au
Dredge on lower Ganes Cr

BEAVER MINING & CONST CO, Box 1082, Fairbanks
Pres: Reino Huttula
PLACER on Gilmore Cr, Fairbanks dist, Au
Idle

BEISTLINE & JACKSON
Box 1150, Fairbanks
MINE, Fairbanks, underground, Au
25-TON AMAL FLOT MILL
(Leased from Cleary Hill Mines)

BELTZ, JOHN
Haycock
PLACER on Bear Cr, Au

BENICK, EDWARD T
Gen Del, Seward
PLACER on Bear Cr, Au

BERG, L C
Box 58, Sitka
BERG BASIN, Silver King Mng Claims, 18 mi SE of Wrangell, underground, Au, Ag, Pb
Under dev

BERRY, C J, DREDGING CO
111 Sutter St, San Francisco, Calif
Pres: A Duane Bush
VP: Othmar Berry
Sec: M K Wild
Gen Mgr: Harold Christensen
GOLD PLACER, Mammoth Cr, 115 mi NE of Fairbanks, bucket dredge
Prod: 3,000 yds

BERRY HOLDING CO
111 Sutter St, San Francisco, Calif
Pres: A Duane Bush
VP: Othmar Berry
Gen Mgr: Harold Christensen
PLACER on Eagle Cr, 115 mi NE of Fairbanks
(Leased by Frasca & Gibson)

BIG FOUR MINE
c/o B A Hagarty, 4209 S 35th St
Tacoma 3, Wash

BIRCH CREEK MINE
Circle dist, Ferry
Owner: Roy Rupp
PLACER MINE, Au
Under dev

BLACK BUTTE MINING CO
Palmer
FERN MINE, Willow Cr dist, lode, Au

BLISS, PATRICK J
Box 2464, Nome
PLACER MINE on Quartz Cr, 80 mi N of Nome, hydraulic dozer, Au

BLOOD, H R
Tanana
GOLD PLACER on Golden Cr

BLUNDELL, JOSEPH B
Wiseman
DRIFT MINE on Wakeup Cr, Ioyukuk dist, Au

BODIS, GEORGE
Nome
GOLD PLACER on Dick Cr, Kougarok dist, hydraulic dozer

BOE, HOMER
Box 114, Seward
NEW HOPE-HIRSHEY MINE, Au, Ag
Idle

BOTT, EARL & LYLE
Fairbanks
GOLD PLACER on Eightmile Cr, Koyukuk dist

BRADLEY, C W
Talkeetna
GOLD PLACER on Cache Cr

BRANDL, PHIL
Talkeetna
PLACER on Cache Cr, Au

BRENNER, EDWIN A
5000 26th St, Seattle 8, Wash
PLACER on No Grub Cr, Nizina dist, Au

BRINKER-JOHNSON CO
351 California St, San Francisco 4, Calif
Pres: W W Johnson
VP: T Keith Johnson
PLACER on Caribou Cr, via Fairbanks, 4 1/2-ft dredge, Au, Ag
Supt: George Hellerich

BROGGER, AXEL
529 E 3rd St, Fairbanks
PLACER on Owl Cr, Au

BRONNICH, FRED
Slana, via Gulkana
PLACER on Slope Cr, Au

BRONSON, MRS J L
Ferry
PLACER MINE on Moose Cr, Kantishna dist, Au

BROOKS, JACK
Chicken
PLACER, 40-Mile dist, Au

CALLAHAN ZINC-LEAD CO, INC, 100 Park Ave, New York 17, New York
Pres: J T Hall
VP Chg Oper: R F Mahoney
VPs: J B Beaty, H J Hull
Sec Alfred Ogden
Treas: E A Salo
LIVENGOOD PLACERS, Livengood, 80 mi N of Fairbanks, Au
5,500-yd dredge

CANNON, ROBERT
Teller
GOLD PLACER on Birch Cr, Nome dist

CANDLE CREEK MINING CO
Candle
Gen Mgr: Jack Allen
GOLD PLACER on Candle Cr, Fairhaven dist

CANYON CREEK MINING CO
Akiak
Gen Mgr: Jens A Kvamme
GOLD PLACER on Canyon Cr
Non-float washing pl

CARLO, WILLIAM
Ruby
GOLD PLACER on Ophir Cr

CARSTENS, H C
Central
PLACER on Portage Cr, Dragline-dozer, Au

CASA DE PAGA GOLD CO
411 Hoge Bldg, Seattle 4, Wash
Pres: Robert Gillespie
VP: Ivan Hyland
Sec Treas: R L Stitt
Gen Mgr: D A Stewart
PLACER, c/o Weins Air Lines, Nome, 20 mi from Deering, Au
hydraulic dozer & dredge
Prod: 5,000 yds

CHAPPELL, OLIVER L
Wiseman
DISCOVERY CLAIM in Koyukuk dist gold placer

CHITITU MINES
McCarthy
PLACER at Rex Cr, hydraulic
Au

CLAICH, MARTIN
1323 First Ave, Seattle, Wash
PLACER on Tanana River, Fairbanks dist

CLARK, DONALD D
Steel Creek
MONTANA #1 PLACER, 40-Mile dist, Au

CLEARY HILL MINES
250 Pere Marquette Bldg, Minneapolis, Minn
Pres & Gen Mgr: R E Wyer
LODE MINE at Fairbnaks, Idle

CLINE, EUGENE
Cape Yakataga
GOLD PLACER on Yakataga Beach

COBLE & FRANCIS
Box 1365, Fairbanks
PLACER on Eureka Cr, Hot Springs dist, Au

COLLINSVILLE MINES
Box 547, Anchorage
Partners: Durand, Campbell, Renfrew, Davis, Neimi, Bjornsgarrd & Bjornsgarrd
GOLD PLACER, 2,500-yd dragline & non-float wash pl

COLORADO CREEK MNG CO
McGrath
PLACER on Colorado Cr, Innoko dist, dragline dozer, Au

COUNCIL DREDGING CO, INC
Rt 2, Box 2055, Edmonds, Wash
Pres: H A Dent
Gen Mgr: F K Dent
Dir: R S Whaley
MINE at Ophir Cr, bucket dredge, Au, Ag, Idle

COYLE & RASMUSSEN MNG CO, Box 1918, Fairbanks
Partners: D Coyle & W D Rasmussen
PLACER on Midnight Cr, Ruby dist hydraulic dozer, Au

CRANE F D & M E KELLEY
Nome
CAPE MT MINE, 105 mi N of Nome on Seward Peninsula, Sn
Under dev

CUMMINS, LARRY
Takeetna
PLACER, Yenta-Cache Cr dist, Au

CURRAN, PETER
Solomon
PLACER on West Cr, Council Bluff dist, Au

DAHL, ROBERT
Talkeetna
#2 BELOW on Nugget Cr, Yentna-Cache Cr dist, gold placer

DAHL & BERNARD, EXP CO
c/o Albert Bernard, Box 1505, Fairbanks
PLACER on Bear Cr, Fairnaven dist, Au

DAWSON MINE
Hollis, Prince of Wales Island
Owner & Operator: Wendell Dawson
MINE & GRAV MILL, Au, Ag
Prod: 25-tons

DEADWOOD MINING CO
Box 152, Fairbanks
Gen Mgr: E H Wrede
Purch Agt: R H Wrede
DEADWOOD MINE, hydraulic placer, Au, Ag
Prod: 400-yds

DEAN, TOM
Hot Springs
PLACER in Miller Gulch, Hot Springs dist, Au

DE COURCEY MT MINE
Crooked Creek
MINE underground, Hg
Idle

DEGNAN, J A MNG CO
Ophir
PLACER on Ophir Cr, Innoko dist, dragline dozer, Au

DEMPSEY, C L
Box 325, Nome
PLACER on Lower Willow Cr, 50 mi NE of Nome, 2 1/2-ft bucket dredge, Au
Under dev

DICK CREEK PLACERS
Nome
Pres: George Bodis
PLACER, Au
Prod: 12,000-yds yearly

DINAN, FRANK J
Rampart
GOLD PLACER near Rampart

DONLIN CREEK PLACERS
Crooked Creek
Gen Mgr: Robert F Lyman
MINES 19 mi N of Crooked Cr, dozer, Au

DOYLE, GEORGE P
Wiseman
PLACER on Vermont Cr, Koyukuk dist, Au

DOYLE, JERRY
Hot Springs
PLACER on Woodchopper Cr, Au

DRAGON, LEE
Fairbanks
PLACER on 40-Mile River

DRAZENOVICH, PAUL
Fairbanks
PLACER on Fish Cr, Bonnifield-Nenana dist, Au

DUTCH CREEK MINE
Talkeetna
Owner: Mike Trepte
PLACER near Yentna, hydraulic monitors, Au

DUVALL, J WM
Steel Creek
GOLD PLACER

EDGECUMB EXPLORATION CO, Box 758, Sitka
(See Calif listing)
ECCO MINE, 10 mi SE of Sitka, Au, Ag, shaft & adit under dev
ECCO GRAV MILL at Silver Bay

ELMER, A M
Gulkana
PLACER on Slate Creek, Au

EMPIRE TIN MINING CO
c/o Carl M Welte, 34 E Town St, Norwich Town, Conn
Trustees: Carl M Welte, Henry G Krakaur
30 CLAIMS at Cape Mt, Cape Prince of Wales, Tin City, underground, Sn
Idle

ENGELHORN, FORREST L
Los Molinos, Calif
PLACER on Cache Cr, Au

ENGSTROM, HERBERT
515 Bomioin Place, Seattle, Wash
JUNE #2 PLACER on Basin Cr, Au
Nonfloat washing pl

ENSTROM & McDOUGALL
Hot Springs
HYDRAULIC PLACER at American Cr, Au

ERNST, HENRY J
Box 229, Fairbanks
PLACER on Bloomer Cr, Talkeetna dist

FAIRBANKS GOLD DREDGING CO, CAROLANDS
Burlingame, Calif
Mgr: A J Watson
OPEN PIT MINE at Fairbanks Cr, dragline, Au, Ag
Idle

FALLS CREEK MINING CO
Seward
Pres & Gen Mge: S A Liening
VP & Sec: A R Bergersen
SKEEN LECHNER MINE, Au, Ag
25-TON FLOT MILL

FEJES & STRANG
Rampart
PLACER on Ruby Cr, dozer, Au

FERN GOLD MINING CO
502 Columbia Bldg, Spokane, Wash
Spokane, Wash
Pres: J L Drumheller
VP: Martin Woldson
Sec: L R Gordon
FERN MINE at Wasilla, underground Au
60-TON AMAL FLOT MILL

FOUR A MINING CO
Box 1498, Fairbanks
Partners: T F Anderson, C J Koudelka
PLACER on Pedro Cr, Hydraulic dozer, Au

FRANKLIN MINING CO
Box 1993, Fairbanks
Partners: Howard Bayless, Dick Roberts, Bob Roberts & Ellis Roberts
PLACERS at Franklin & Chicken, Au
hydraulic, dragline, dozer
(Leased from Fred Whitehead)

FRASCA & GIBSON
Box 1182, Fairbanks
PLACER on Eagle Cr, Circle dist, hydraulic dozer
(Leased from Berry Holding Co)

FRENCH, WILLIAM
Candle
HYDRAULIC PLACER on Jump Cr, Fairhaven dist, Au

FREY BROS MINE
Box 693, Palmer
PLACER in Yentna-Cache Cr Dist, Au

GAGNON PLACER MINE
Box 821, Anchorage
Owner: Paul L Gagnon
PLACERS, Talkeetna, hydraulic, Au, W
Under dev

GAYAK, ANDREW
Fairbanks
PLACER on Stuyhok Cr, Fairbanks dist, Au

GEARHART, H O
Boundary
PLACER, Yukon River Basin dist, Au

GLASS, CLYDE D
Solomon via Nome
PLACER on Solomon River, Nome dist

GILLETTE, B F
Nome
PLACER on Anvil Cr, Au

GLISKA, JOE
Talkeetna
PLACER on Pass Cr, Au

GIRTLER & MYKLEBUST
Ophir
PLACER on Little Cr, Innoko dist, Au, nonfloat washing pl

GOLD DUST MINING CO
Nome
Gen Mgr: J L Bullock
PLACER on Kougarok River, Au bucket dredge
Prod: 2,500-yds

GOLD MINT MINING CO
Hope
Gen Mgr: D Whiting
MINE, Palmer Cr, Kenai, Au
Under dev
Supt: Gordon Gallup

GOLD PLACERS, INC
4556 University Way, Seattle, Wash
Pres & Gen Mgr: E N Patty
VP: Walter Seligmon
Dirs: E B Bull, Mrs A D McRae
GOLD PLACER, Coal Cr, Circle dist, 4-yd dredge

GOODNEWS BAY MINING CO, INC, 423 White Bldg, Seattle, Wash
Pres: A O Olson
VP: Edward Olson
Sec: R W Vinnedge
Treas: C J Johnston
GOODNEWS BAY PLACER, bucket line dredge, hydraulic & dragline dozer, Pt
Supt: Edward Olson
Purch Agt: John C Hill
Engr: W W Spencer

GRANITE CREEK MINING CO
Ruby
Partners: W Carlo, J J May
PLACER, 50 mi S of Ruby, hydraulic dozer, Au, Ag

GRANT LAKE MINE
Moose Pass
Owner: Wm Kelley
QUARTZ MINE 4 mi from Moose Pass, irregular vein, block caving Au, Ag
GRAV MILL & SMELTER
Under dev

GRANT MINING CO
Nome
Gen Mgr: Henry Wuhrman
PLACER, Coffee Cr, Kougarok dist, hydraulic, Au

GREIST, DAVID & JOHN OLSON, Selawic
PLACER on Selawic River, Au

GRUBSTAKE MINE, INC
Wasilla
MINE & MILL at Grubstake Cr, Au
Under dev

HAGBERG, MRS LAURA
Haycock
PLACER on Bear Cr, Fairhaven dist, Au

HAMBERG & GLISKA
Talkeetna
PLACER on Pass Cr, Yentna-Cache dist

HAMBLIN, MARK E
Talkeetna
PLACER, Yentna-Cache Cr dist, Au

HAMILTON, RAY & ASSOC
Millerhouse
HYDRAULIC PLACER on Harrison Cr, Circle dist, Au

HANNUM CREEK MINING CO
Inmachuck via Deering
PLACER on Hannum Cr, Fairhaven dist, Au

HANSEN, BURNETT F
Eagle
PLACER on Alder Cr, Au

HARD & UOTILA
Ophir
Gen Mgr: Eric Hard
FORGOTTEN BENCH PLACER, Innoko dist, nonfloat
BEAR CREEK PLACER, dragline, 2 dozers

HAROLD HASSEL & STICKA
Box 1071, Fairbanks
MINE on Ready Bullion Cr, Stripping and ground sluicing, Au

HATTON & TURNER
Flat
PLACER at Flat, Au

HAVENSTRITE MINING CO
811 W 7th St, Los Angeles, Calif
Pres: R E Havenstrite
Gen Mgr: Jack Allan
Purch Agt: Joe Kroninger
MUD CR OPERATIONS, Candle, dredge, Au
Supt: Larry Doheny
CANDLE CR OPERATIONS, Candle, dragline
Supt H B Palmer

HAYES & WHITELEY ENTERPRISES, Box 856, Juneau
Partners: Howard Hayes & Stan Whiteley
ALASKA JUNEAU tailings, owned by Alaska Juneau Mining Co
TREADWELL tailings, recovery of gold by placer methods
CHICAGOFF MINING CO tailings, Au, Ag
GRAV FLOT MILL

HELCOLICON MINES, INC
1005 Ruddiman Ave, North Muskegon, Mich
Pres: Robert C Armstrong
C-B DREDGE, Kiery Cr, Kiana dist

HIRST-CHICHAGOF MNG CO
415 7th Ave S, Seattle, Wash
Pres: Geo Meagher
Dirs: Wallace Lewkay, Dan Coon, Frank Sperkert, W Sham Shinn
HIRST-CHICHAGOF MINE, lode, Au
Under dev
50-TON AMAL FLOT MILL

HOPE MINE
c/o R V Watkins, Box 521, Fairbanks
PLACER on Deep & Faith Cr, hydraulic dozer, Au

HOSLER MINES
McKinley Park
Gen Mgr: Elmer Hosler
PLACER on Eureka Cr, Kantishna dist, non float operation

HOUSTON, ALEXANDER
Nome
PLACER on Dahl Cr, Au

HOVELY, OTTO
Hot Springs
PLACER on Cache Cr, Au

HUNTER & BURNETT
Fairbanks
PLACER on Crooked Cr, Kantishna dist, hydraulic, Au

HUNTER CREEK MINING CO
c/o Melo Jackovich, Box 92, Fairbanks
PLACER on Hunter Creek, Rampart dist, Au, hydraulic dozer

HURST, VERNON J
Fairbanks
PLACER, Chandlar dist, Au

IDITAROD OPERATING CO
Tanaina
Gen Mgr: Beo Rosander
Partners: F Edginton, Lars Indegard
PLACER, Kallanda Landing, Au, Ag

INNOKO DREDGING CO, INC
914 2nd Ave, Seattle, Wash
Pres: J F Griffiths
Sec: F H Molitor
Gen Mgr: Wilbur Finnigan
GANES CR PLACER, Ganes Cr, bucket dredge, Au, Ag
Prod: 3,000 yds

JACKSON, KIRK D
Solomon
PLACER on Big Hurrah Cr, Nome dist, Au

JACKSON MINE
Box 965, Fairbanks
Owner: Nels Jackson
PLACER at Totatlarnika, hydraulic dozer, Au
Under dev

JANEAU, E A
Steel Creek
SMITH CR BENCH CLAIMS, hydraulic, Au

JENKINS, FRED F
Eagle
PLACER on Flume Cr, Au

JOHNSON, ARTHUR D
Haycock
PLACER on Sweepstake Cr, Ioyuk dist, Au

JOHNSON AXEL
Council
PLACER on Pancake Cr, Council Bluff dist, Au

JOHNSON, ENGBERT
Fairbanks
PLACER on Ingle Cr, 40-Mile dist

JOHNSON, FURSETH & TROSETH, Fairbanks
PLACER on Cleary Cr, Au

JOHNSON, HELMER
Box 935, Fairbanks
PLACER on Cleary Cr, hydraulic dozer, Au

JOHNSON, IVER & CO
Ruby
PLACER on Trail Cr, hydraulic, Au

JOHNSON & JOHNSON CO
Box 914, Fairbanks
PLACER on Eureka Cr & Glen Gulch, hydraulic

JOHNSON, PETE
Hot Springs
PLACER on Eureka Cr

JOKELA & LAZERATION
Box 2000, Fairbanks
Partners: Verne Jokela, Carl Lazeration
GREENBACK CLAIMS, 22 mi N of Fairbanks, underground, Au, Ag
(Leased from Cheechako Mng Co)

JONES, ROBERT H
Wiseman
PLACER on Smith Cr, Koyukuk dist

JUMP CREEK MINES
Candle
Owner, Fred Weinard
Gen Mgr: O F Weinard
PLACER, hydraulic, Au

JURICH, JOHN & CARR, TOM LIVENGOOD
PLACER on Lilliam Cr, hydraulic

KANARI & CAREY MNG CO
Box 255, Nome
PLACER on Kougarok River, Cape Nome precinct, hydraulic, Au

KING, GEORGE
Boundary
PLACER on Turk Cr, 40-Mile dist

KINNEY, MRS PAUL
Haycock
PLACER on Sweepstake Cr, Koyuk dist, Au

KLOSS & DAVIS
Sunset Cove
Partners: Herman Kloss & Jack Davis
K & D MINE, 2 mi from Sunset Cove, vein under dev by shaft & adit, Au, Ag, Sb, Zn, Pb, Cu
K & D MILL
Prod: 2-tons

KOUGAROK FREIGHTING & MINING CO, Nome
PLACER on Buster Cr, Au
Under dev

KUPOFF, N O
Box 1660, Fairbanks
PLACER on Pedro Cr, Au

L & L MINING CO
826 E 26th Ave, Spokane, Wash
PLACER on Tofty Gulch, Hot Springs dist, Au

LANE, SOLOMON
BIG HURRAH MINE & MILL
Au, W
Under dev

LANGLOW, JENS
Central
PLACER on Smith Cr, Cirle dist

LANNING, TONY
Hot Springs
PLACER on Omega Cr, Au

LARSEN & BERG
Hot Springs, c/o Al Berg
DRIFT MINE on Woodchopper Cr, Hot Springs dist, Au

LEACH, F M
Hot Springs
PLACER on Portage Cr, Circle dist, Au

LEE BROS DREDGING CO
Solomon
Gen Mgr: Richard Lee
PLACER on Solomon River, Seward Peninsula, bucketline, Au, Ag
Engr Allan W Lee
PROD: 7,500-yds

LEONARD, HARRY B
Wiseman
PLACER on Gold Cr, Koyukuk dist, Au

LEOV, HARRY
Flat
PLACER on Malamute, Iditarod dist, hydraulic, Au

LeROY MINING CO
Juneau
RAINBOW & LeROY MINES at Glacier Bay, underground, Au
Idle

LINN, ELI
Ruby
LINN MINE at Trail Cr, Nulato, dragline, Au

LITTLE MINOOK MINING CO
Box 1505, Fairbanks
Pres & Gen Mgr: Albin Martin
PLACER on Little Minook Cr, Rampart dist, dragline & hydraulic dozer, Au, Ag
Prod: 600-yds

LONG CREEK MINING CO
Ruby
Gen Mgr: Hans Tilleson
PLACER at Long Cr, hydraulic & dragline, Au, Ag

LOST CHICKEN MINING CO
Chicken
Partners: Harold Pierce & James Hulbert
PLACER on Lost Chicken Cr, 40-Mile dist, hydraulic dozer, Au

LOUIS, FRANK
Box 810, Fairbanks
PLACER on No Grub Cr, Au

LUCKY NELL MINING CO
1525 Puget Sound Bank Bldg, Tacoma, Wash
Pres: Ben J Scott
VP & Gen Mgr: H H Tilley
LUCKY NELL MINE at Ketchican, Au, Ag, Pb
Agt: J J Matvska
Foreman: Clyde Maxwell
50-TON FLOT MILL
Under dev

LUCKY SEVEN MINE
Millerhouse
PLACER on Mastadon Cr, Circle dist, Au

LUNDSTROM & STOUT
Chicken
Gen Mgr: Elmo Stout
PLACER on Napoleon Cr, hydraulic dozer, Au

LYMAN, R F
Flat
PLACER on Crooked Cr, Eagle dist, Au

MADDEN, LYMAN H
Box 661, Nome
PLACER on Garfield Cr, 100 mi N of Nome, hydraulic dozer, Au

MARTIN, G B
Box 662, Fairbanks
PLACER on Banner Cr, hydraulic dozer, Au

MARTIN & MARTIN MNG CO
Box 662, Fairbanks
Pres & Gen Mgr: A I Martin
PEDRO MINE, DISCOVERY CLAIM, Pedro Cr, hydraulic dozer, Au
Supt: G B Martin
Engr: A B Martin

MARTINSEN, OLAF
Teller
PLACER on Gold Run Cr, Port Clarence dist

MARVEL CREEK MNG CO
Aniak
Gen Mgr: J C Awe
MARVEL CR MINE, dragline hydraulic, Au
Prod: 1,000 yds

MAURER, ERNEST
Box 728, Fairbanks
FIRST CHANCE CR MINE, open pit & Placer, Au

McCARTHY, ELLSWORTH
Fairbanks
PLACER on Wade Cr, 40-Mile dist, Au

McDONALD, JAMES J
Hot Springs
PLACER on Pioneer Cr, Au

McFARLAND, I C
Ophir
PLACER on Little Cr, Innoko dist, Au

McGARVEY, JOHN F
Hot Springs
PLACER On Bachelor Cr, Au

McGEE, L
636 Lindley Way, Reno, Nev
PLACER on Sullivan Cr, Hot Springs dist, Au
Nonfloat washing pl

McIVER, WALLACE
Council
PLACER on Crooked Cr, Council Bluff dist, Au

McMAHAN, C H
Box 1814, Palmer
PLACER on Albert Cr, Nelchina dist, dozer, Au

MEATH, LARRY
Fairbanks
PLACER on Wade Cr, 40-Mile dist, Au

MELDRUM, WM
Chicken
NUMBER 1, above Discovery Claim on Chicken Cr, 40-Mile dist, open pit & Placer, Au

MIDDLE FORK MINING CO
803 Artic Bldg, Seattle, Wash
Pres: H E Cleveland
PLACER at Gulkana, Au
Gen Mgr: J F Malony
Engr: M W Jasper
Under dev

MILLER, FRANK J
Box 614, Fairbanks
PLACER on Sheep Cr, Au

MILLIGAN, C F
Council
PLACER on Ophir Cr, Council Bluff dist, hydraulic, Au

MISCOVITCH BROS
Poorman (also Flat)
PLACER on Flat Cr, Ruby dist, hydraulic dozer & dragline, Au
PLACER on Otter Cr near Flat hydraulic dozer, back hoe

MOFFAT, T W
Nome
PLACER On Klery Cr, Kiana dist, Au

MONTAGUE, STERLING
Monroe, Wash
PLACER on Buzzard Cr, Kougarok dist, Au

MONTANA LEAD & ZINC CO
Box 1771, Ketchikan
Pres: Robert Crowe-Swords
MAHONEY MINE, George Inlet, underground, Pb, Zn
FLOT MILL
Idle

MORELOCK MINING CO
Tanana
PLACER on Rosa Cr, Hughes dist

MT KIMBALL CONSTRUCTION CO, Slate Creek via Gulkana
PLACER on Slate Cr, Chistochina dist, Au
(Leased from Slate Cr Gold Placers)

MUNZ, WILLIAM S
Nome
PLACER on Rock Cr, Council Bluff dist, Au

MYRTLE CREEK MNG CO
911 American Bldg, Seattle Wash
Partners: H F Molitor & Repo Est
PLACER, Box 7661, Fairbanks, dragline dozer, Au, Ag

NASS-KASS-OLSEN MINE
Haycock
MINE at Dime Cr, Kovuk, drift, Au
Under dev

NATIVE BISMUTH, INC
Box 267, Nome
Pres: O A Margraf
VP: D M Russell
Sec: O E Margraf
Treas: W E McDonald
Dirs: Ignacy Kowalski, W R Russell
NATIVE BISMUTH MINE, 35 mi N of Nome, vein under dev by adit

NAUDTS, CASIMIR
Ophir
PLACER on Yonker Cr, Innoko dist, shovel-in operation, Au

NECK, V E
Wiseman
PLACER on Myrtle Cr, Koyukuk dist, Au

NELSON, A T
Fairbanks
PLACER on Wade Cr, 40-Mile dist, Au

NELSON, NELS
Council
PLACER on Melsing & Ophir Cr, Council Bluff dist, Au

NELSON, WALLACE
Haycock
PLACER on Sweepstake Cr, Koyuk dist, Au

NESLAND & WHITE
Wiseman
PLACER on Vermont Cr, Koyukuk dist, nonfloat operation

NEW IDRIA QUICKSILVER MINING CO, (see Calif)
RED DEVIL MINE near Flat, underground, Hg
(Operated by Mellich & Halvorson)
30-TON Gould rotary furnace

NEWLAN, JAMES
Box 1170, Fairbanks
PLACER on Pedro Cr, Au

NEW YORK-ALASKA GOLD DREDGING CORP, Nyac
(See Northeastern & Wash listings)
NEW YORK-ALASKA MINE, 60 mi NE of Bethel, placer, 2 dredges dragline, Au
Asst Gen Mgr: Wm H Race
Engr: Clarence Clark

NIEMI, WAYNE J
Box 1791, Mountain View
PLACER on Jumper Cr, Yukon R Basin region, Au

NIUKLUK MINING CO
Council
PLACER on Niukluk River, Council Bluff dist

NORTH AMERICAN DREDGING CO, Flat
Owner Alex Mathieson
PLACER at Flat, Iditarod dist, 2,500-yd bucketline, Au

NORTHERN TIN CO
c/o Alaska Airlines, Nome or 589 E 89th, Seattle 5, Wash
Sec & Gen Mgr: George Ramstad
Treas: Wm Ramstad
PLACER, Buck Cr, 120 mi NW of Nome, dragline, Sn

NORTH FORK DREDGING CO
Nome
Owner: A J Petersen
HARRIS CR MINE, bucketline placer Au
(Leased by MacDonald & Reader)

NOVATNEY, ROBERT A
Ketchikan
MILLER'S LEDGE & LODGE LODE MINES, under dev

O'LEARY & CO
Nome
PLACER on Bluestone R, Port Clarence dist

OLIVE CREEK MINES
Box 552, Fairbanks
Gen Mgr: Carl Parker
PLACER on Olive Cr, 80 mi NW of Fairbanks, dragline dozer, Au, Ag

OLSEN, SEWARD
Wiseman
PLACER on Crevice Cr, Koyukuk dist, Au

P H & H MINING CO
Box 462, Fairbanks
Partners: F D Parker, J W Raymond, F O Hopkins
P R & H PLACER on Deadwood Cr, Circle dist, dozer, nonfloat, Au, Ag

PETERSON, ANDREW
Nome
PLACER on Iron Cr, Nome dist, Au

PIERCE, JIM
Nordale Hotel, Fairbanks
PLACER in Fairbanks dist

PILGRIM, EARL R & CO
Box 1896, Fairbanks
Gen Mgr: Earl R Pilgrim
STAMPEDE MINE, 110 mi SW of Fairbanks, vein developed by adits, mined by shrinkage & open stoping
STAMPEDE GRAV MILL, 30-ton

PIONEER MINING CO
c/o J H Pierce, Rampart
PLACER on Hoosier Cr, Au
Nonfloat washing pl

PITTS, E H
Big Lake
LAKE CR PLACERS, Big Lake, hydraulic, Au, Ag
Idle

PORTER, WALLACE
Haycock
PLACER on Bear Cr, Au

POWERS MINE
Eagle
MINE at Dome Cr, hydraulic, Au

PRICE, STAN
Windham
PLACER on Prince Cr, Iditarod dist, hydraulic dozer

PRINGLE, A W
Hot Springs
MINE on Rhode Island Cr, hydraulic, Au

QUIGLEY, E W
Solomon
PLACER at Solomon River, Cape Nome, hydraulic, Au

RADAK, JOHN
Livengood
PLACER on Ruth Cr, Tolovana dist, hydraulic, Au

RAINBOW MINES
Kougarok
PLACER, Kougarok dist, Au

RASSMUS, PAUL
Box 398, Nome
PLACER on Quartz Cr, Kougarok dist, Au

RASSMUSSEN, W
Fairbanks
PLACER on Big Cr, Chandalar dist, Au

REDE, MAX
Fairbanks
PLACER on Pedro Cr, Fairbanks dist, Au

RENSHAW, A L
Box 1875, Anchorage
GOLD CORD MINE, Willow Cr dist, lode, Au

REPO, ARVI
Wiseman
PLACER on Myrtle Cr, Koyukuk dist, Au

RICE, C F & CO
Teller
PLACER at Sunset Cr, Fort Clarence dist, hydraulic, Au

RILEY, J E INVEST CO
Flat
Partner: Thomas Jensen
PLACER on Otter Cr, near Flat hydraulic dredge, Au
Under dev

ROCKY MT MINING CO
Box 78, Nome
Partners: May Bale & Hugo Lindfors
PLACER on Christian Cr, Au, W

ROLANDO, NORMAN
821 S Yakima Ave, Tacoma, Wash
PLACER on Gaem Cr, Council dist

ROSANDER & REED
Box 451, Fairbanks
Pres: T Rosander
PLACER on Yankee Cr, Innoko dist, hydraulic dozer, dragline

RUPTURED DUCK MINERS
Ophir
PLACER on Ruptured Duck Claim, Innoko dist, Au

RYLANDER, SOPHIE
Haycock
PLACER on Sweepstake Cr, Koyuk dist, Au

SANTIAGO-ALASKA MINES INC, 227 Commercial Bldg, Ketchikan
Pres: R Crowe-Swords
VP: C R M Cale
Sec Treas: S B Snell
MINE, Dolomi, underground, Au
Mgr: H Tweit
Engr: W Erickson
100-TON CYANIDE MILL
Mgr: W Griffiths
Under dev

SAVAGE & MATHESON
Ophir
Gen Mgr: Hugh Matheson
PLACER on Spruce Cr, hydraulic dozer, Au
Prod: 1200-yds

SAVAGE, PATRICK
Flat
PLACERS on Flat & Willon Cr, Iditarod dist, dragline dozers, Au

SCHAEFER, RUSSEL R
Crooked Creek
PLACER on 47 Cr, Kuskokwim region, Au

SCHUERCH, L O
Nome
PLACER on Klery Cr, Au

SCOTT, J H CO
(See Calif listing)
RIVERSIDE MINE, Hyder dist, lode, Au, Ag, Pb
100-TON MILL
Idle

SCOTT, TOLBERT & SON
Nome
MINE at Iron Cr, Cape Nome bucketline, Au
Engr: Robert Scott
Elec: Wilson Scott

SHAW & COOK
Unalakleet
PLACER in Hopeful Gulch, Au

SILVER BOW MINING CO
Box 603, Nome
COFFEE CR PLACER, Kougarok dist, Au

SLATE CR GOLD PLACERS
Valdez
Owner: J M Elmer
PLACER at Slate Cr, Chitina, hydraulic, Au, idle

SMITH, FRANK H
Wild Lake via Wiseman
PLACER on Spring Cr, Au

SNOWBIRD MINING CO, INC
Box 1719, Anchorage
Pres & Gen Mgr: Chris Poulsen
VP: H A Faroe
Sec Treas: Charles J Johnston
SNOWBIRD MINE, 22 mi N of Palmer underground, Au
FLOT MILL
Watchman: Ole Jensen
Idle

SOURDOUGH DREDGING CO
Nome
Partners: Chester Milligan, Jack LaCross, H E Janeway
MINE at Council, bucketline, Au

SOUTH FORK MINING CO
Box 507, Fairbanks
Owners: Gus Uotila, Victor Nick John Ogriz, Elmer Keturi
MINE in Koyukuk dist, E of Bettles, dragline dozer, Au

SQUAW CREEK MNG CO
c/o Jack Wilkey, Boundary
PLACER on Squaw Cr, 40-Mile dist, Au

SROUFE, WARD
Box 718, Anchorage
OLD MARRIED TWINS MINE, Willow Cr Dist, lode, Au

STANICH BROS
Wiseman
PLACER on Porcupine Cr, drift operation, Au

STANTON, HAROLD
Talkeetna
PLACER on Upper Falls Cr, Yentna-Cache Cr dist, hydraulic, Au

STEEN, HARRY
Flat
PLACER on Julian Cr, Iditarod dist, Au

STEPOVICH MINE
Fairbanks
Owner: Mike Stepovich
PLACER on Lower Fish Cr
(Leased to U S Smelting & Ref)

STRANBERG & SONS
Box 2099, Anchorage
BUCKETLINE DREDGE on Candle Cr, McGrath dist, Au
DRAGLINE DOZER on Utopia Cr, Hughes dist, Au

STUVER, JULIAN
Flat
PLACER on Happy Cr, Iditarod dist, Au

SUNSET MINING CO
Box 1595, Anchorage
Partner: Jack Neubauer
OPEN PIT, PLACER, hydraulic, 2 cats, Au

SWANSON BROS
Rampart
Partners: Albert & Emil Swanson
PLACER on Hunter Cr, 4 mi E of Rampart, hydraulic dozer, Au

TARASKI, A J
Talkeetna
PLACER on Cache Cr, Au

TAYLOR CR PLACERS
Fairbanks
Partners: Elmer Keturi, Gus Uotila, Eugene Uotila, J Ogriz
PLACER, Sleetmute, dozer, dragline, Au

TELLER MINING CO, INC
609 Colman Bldg, Seattle, Wash
Pres: E W Wardin
VPs: C B Setter, A G Johnson
Gen Mgr: F L Rice
Asst Gen Mgr: Larry Garfield
SUNSET CREEK MINE, Teller, hydraulic placer, dragline, Au, Ag
Under dev

TERREL, FRED
Wiseman
PLACER on Garnet Cr, Au

TIGER TALISMAN PLACER
Box 294, Nome
Gen Mgr: J H Alexander
250-YD hydraulic, Au, Ag

TRONSTAD & GOODWICK
c/o Ted Tronstad, Box 1015, Fairbanks
PLACER on Dahl Cr, Skungnak dist

TWEET, N B & SONS
Teller
PLACER on Humbolt Cr, Fairhaven dist, hydraulic, Au

UHLER CREEK MINING CO
Box 674, Fairbanks
Partners: R A Brown, M A Straiger, A C Dill, Louie Paun
UHLER CR MINES, hydraulic dozers Au

ULEN, E J
Wiseman
PLACER on Nolan Bench, Koyukuk dist, hydraulic, Au

UNITED STATES SMELTING REFINING & MINING CO
(See North Eastern listing)
VP & Gen Mgr, Alaskan Operations: Roy B Earling
FAIRBANKS DEPT, 8 Gold dredges at Fairbanks, 1 gold dredge at Chicken Cr
Mgr: J D Crawford
Supt: J C Boswell
Cashier: L E Linck
NOME DEPARTMENT, 4 gold dredges
Mgr: C S Glavinovich
Cashier: Robt Baldwin

UNITED STATES TIN CORP
201 Jones Bldg, Seattle, Wash
Pres: H R Fischnaller
Sec: H C Rohrback
Purch Agt: F H Furey
LOST RIVER TIN MINE, Teller, underground & placer, Sn, W
Gen Mgr: A F McIntosh
Supt: J M McDonald
Met: Erwin Adler

UOTILA & HARD
Ophir
Pres: Eric Hard
Gen Mgr: Gus Uotila
OPHIR CR MINE, Innoko dist, hydraulic dozer, dragline, Au, Ag

UOTILA & OGRIZ
Flat
Mgr: John Ogriz
SLATE CR PLACER, Flat, hydraulic dozer, dragline, Au

VAGABOND MINE
c/o L K Chester, Eagle
PLACER on 70-Mile River, Au
Under dev

VAN WINDEN, JOHN
2453 E 23rd St, Oakland, Calif
PLACER on Ready Bullion Cr

VICTOR CR MINING CO
c/o Ivor Carlson, Ophir
PLACER on Victor Cr, Innoko dist, dozer, Au

VIRDEN, E P
Fox
NUMBER 12 MINE above Discovery in Fox Gulch, placer, Au

VURICH, BILLY
Box 1496, Fairbanks
PLACER on Sheep Cr

WACKWITZ, FRED
Box 1595, Fairbanks
PLACER on Cleary Cr, Fairbanks dist

WADE CR DREDGING CO
Box 1108, Fairbanks
Partners: C F Herbert, E Ellingen H Schmidt, L J Stampe
WADE CR PLACER, Jack Wade, dozer, Au, 1200-yds

WAGER BROS
Box 809, Fairbanks
PLACER on Gold King Cr, Au

WALSH, M J
Nome
PLACER on Mascot Gulch, Au
(Leased by Noonan & Whitmore)

WARWICK MINES
Box 807, Fairbanks
Gen Mgr: Andy Warwick
Gen Supt: W M Warwick
Acct: E M Warwick
PLACER on Gertrude Cr, 2 mi NE of Livengood, hydraulic dozer, Au
GRAV MILL

WATSON, B B
Cape Yakataga
BEACH PLACER, Yakataga dist

WEATHERELL, GEORGE H
Talkeetna
PLACER on Gold Cr, Yentna-Cache Cr dist, Au

WEAVER, VERNON
Chicken
PLACER on 40-Mile River, Au

WEBB, H L & CO
Box 68, Fairbanks
DRIFT MINE at Chandalar, Au
Under dev

WEBFOOT MINING AND MILLING CO, 400 New World Life Bldg, Seattle, Wash
Pres: J M McDonald
WEBFOOT MINE, Palmer, underground, Au
Under dev

WEISNER, IRA
Fairbanks
PLACER on Hoosier, Rampart dist, Au

WETTACK, SHELDON
431 S Grand Ave, Los Angeles
PLACER on Long & Nolan Cr, Ruby dist, Au

WICKSTROM & CO
Fairbanks
PLACER on Gilmore Cr, Au

WILBUR CREEK MINES
Livengood
PLACER on Wilbur Cr, Tolovana dist

WILDT, FRED
Box 163, Fairbanks
PLACER on Homestake Cr, Au

WILKINSON, R R
16540 Aurora St, Seattle, Wash
PLACER on Miller Cr, Circle dist, Au
Nonfloat washing pl

WILLIAMS MINING CO
Box 1190, Fairbanks
PLACER on Gilmore Cr, Au

WILSON CREEK MINING CO
Anchorage
Pres: W N Curdy
Dir: H C Bennett
MINE at Elephant Gulch, Au, Ag
Gen Mgr: A I Erickson
Purch Agt: A J Erickson
Idle

WINDERS, J S
Haycock
PLACER on Sweepstake Cr, Koyuk dist, Au

WIRUM BROS
Box 481, Nome
PLACER on Niukluk River, Kougarok dist, Au

WITHROW, A W
Fairbanks
PLACER on Koyukuk River, Au

WOLF CREEK MINING CO
Box 141, Fairbanks
Pres: Andrew Anderson
Gen Mgr: Norman Gustovson
PLACER, hydraulic, dragline dredge
Supt: Mannie Olson
Under dev

XAVIER, HENRY & SOLVEIG
8005 Pacific Ave, Tacoma, Wash
PLACER on Goldrun Cr, Fairhaven dist

YUKON CORP
Box 1835, Fairbanks
Pres: W H Coffman
Gen Mgr: C A Sherman
Mgr: G H Porter
Purch Agt: J Leger
PLACER MINES: Standard Miller, Totalanika, Eva Cr, Hutchison Cr, Placer, Royal Flush, Gilmore Dome, & Fox Bar, Au, Ag, Pt
BUCKET DREDGE at Fox Bar
Supt: C E Smith
Asst Supt: E C Hulbert
Foreman: J Strickland
FLOT MILL at Gilmore Dome
Supt: M J Newby
Asst Supt: I H Robertson
Foreman: A G Huber

YUKON MINING CO
Anchorage
KAKO CR PLACER near Stuyahok, 2 1/2-yd dragline & wash pl, Au
Operators: Jos Ranstad & Bros

YUKON PLACER MINING CO
Box 1108, Fairbanks
Partners: C F Herbert, Earl Ellingen, L J Stampe, Glen Franklin, Harold Schmidt
PLACER on July Cr, Nation Au
60-MILE OPERATION, placer at Glacier Cr, hydraulic dozer
HYDRAULIC DOZER on Canyon Cr, near Boundary

ZAISER, CLARENCE
Ruby
PLACER on Spruce Cr, Ruby dist, Au

ZAISER, LEONARD
Ruby
PLACER on Timber Cr, Au

ZENDA GOLD MINING CO
(See Nevada)
MINE near Cape Cr, tin dredging
Tin City (summers)

ZIMMERMAN MINES
Fairbanks
Owner: A A Zimmerman
PLACERS on Independence Cr near Millerhouse, hydraulic dragline, Au

ARIZONA

A-D-E CONTRACTING & DEV CO, Box 508, Patagonia
BULL SPRINGS GROUP, Santa Cruz Co, Zn, Pb

ACME MNG & DEV CO
Box 49, Ruby Star Rt, Tucson
Pres: Frank Maddock
MARY G CLAIM, Pima Co, shaft
Supt: D B Chester

ABE LINCOLN COPPER CO
Wickenburg
MINE, Maricopa Co, Cu
Mgr: E I Mills, Jr

ABRIL MINE
Tombstone, Zn, Cu
Mgr: S B Owens

ADVENTURE MINE
1120 Grand Ave, Phoenix
Mgr: Louis Upman
Fluorspr
Under dev

AKREN MINES
2207 N 24th St, Phoenix
Pres: J A Akren
Gen Mgr: Fred Jenkins
PIONEER MINE, 20 mi E of Florence, underground & open pit, Au, Ag, Cu, Pb
Assay: Charles Deal
Under dev

ALEXANDER, T W
Box 299, Prescott
U S GROUP, Yavapai Co, Pb, Zn

ALEXANDER, VERDIN
Box 142, Humbolt
LOOKOUT MINE, 2 1/2 mi W of Humbolt on the Silver Belt Vein, Au, Ag, Pb, Zn
Owner: Rable Estate
MOUNT ELLIOT MINE, 7 mi W of Humbolt, Au, Ag, Pb
Gen Mgr: Robert Tucker

ALKEY MINE
Tombstone
Pb, Ag
Mgr: Jeff Humphrys

ALLEY & HODGE
c/o G T Alley, Box 155, Ajo
85 MINE, Pima Co
Idle

ALLISON MINE
Sells
Au
Mgr: Maurice Hedderman

ALLISON STEEL MFG CO
Box 6067, Phoenix
Mgr: W L Allison, Sr
PEACH MINE, Pima Co, open pit, Cu
SHELDON MINE, Yavapai Co, underground, Au, Ag, Cu, Pb, Zn
Under dev

ALTO MINE
Patagonia, Pb, Cu, Ag
Mgr: Ray Bell

ALTUDA MINES INC
Gila Bend
MINE, Maricopa Co, Au, Ag, Cu
Mgr: D C Gills

ALVARADO, LUIS
Hayden
ALVARADO CLAIMS #1-8, Gila Co, Cu, under dev

AMERICAN ASBESTOS CEMENT CORP, Box 3022, Globe
Pres: Ammon R Smith
Sec: McClean Stock
Auditor: Don E Williams
Agt: George W Kohl
AMERICAN ASBESTOS MINE, 90 mi N of Globe, Chrysotile asbestos Horiz vein mined by room-pillar
MILL, dry crushing & screening, 25-tons
Mine & Mill Mgr: M Stockman
Engr: L J Brewer

AMERICAN MINE
Miami, Cu, Ag
Mgr: Jack Quinn

AMERICAN SMELTING & REFINING CO, 120 Broadway, New York City, N Y
(See North Eastern listing)
WESTERN MNG DEPT, SW DIV
813 Valley Nat'l Bldg, Tucson
Mgr: F V Richard
Ch Geol: L K Wilson
TRENCH UNIT, Patagonia, underground, Pb, Zn
Supt: W C Waidler
200-TON FLOT MILL
HAYDEN PLANT, Hayden, 1200-ton smelt & conv, Cu
Supt: F J Downey
SW ORE PURCH OFFICE, 810 Valley Nat'l Bldg, Tucson
Mgr: Reed F Welch

ANDERSON & FICKETT
Arivaca
CHOCTAU MINE, Pima Co, Pb, Ag
Mgr: J D Jay

ANNIE MINE
Box 211, Nogales, Zn, Pb
(Leased by M Perkins & F Medina)

APACHE ASBESTOS MINES
Box 983, Globe
Pres: L S Rayes
VP: Barry DeRose
Dir: B B Gulledge
Gen Mgr & Supt: H P Brewer
APACHE ASBESTOS MINE, 50 mi NW of Globe, vein adit, asbestos
MILL under construction

APACHE VANADIUM CORP
180 E Bailey St, Globe
MINE, underground, Pb, Au, Ag

ARIZONA ANTLERS MNG CO
602 Beason Bldg, Salt Lake City
Pres: F F Hintze
ANTLERS MINE, Box 67, Yucca, Au, Ag, Cu, Pb, Zn
Prod: 500-tons

ARIZONA BARITE
Box 926, Mesa
Pres: George O'Leary
Gen Mgr: W F Paine
Dir: E H Robertson
MINE, underground, barite
Foreman: Clark Everett
100-TON FLOT MILL
Foreman: Larry Mathis
Assay: Thomas Clay

ARIZONA CHRYSOTILE ASBESTOS, Dominion Hotel Bldg, Globe
Pres: C E Hunziker
Gen Mgr: G B Gulledge
Sec: H A Twitty
REGAL ASBESTOS MINE, Box 328, Globe
Prod: 25-tons
Mine & Mill Supt: D E Brown
Asst Mine Supt: Frank Sanchez
Asst Mill Supt: Robert Leturno
Engr: D W Jaquay

ARIZONA CONS GOLD & COPPER MINES CO, Florence
Mgr: J F Johnson
Idle

ARIZONA COPPER MINES INC
Oracle
Pres: J E Moewinckle
Gen Mgr: W R Shanklin
MINES, 20 mi N of Tucson, Cu
Supt: Louis Stickradt

ARIZONA-KLONDYKE MINE
Dos Cabezas, Au, Ag, Pb
Mgr: Robert Hyde

ARIZONA METALS CO
Box 1266, Kingman
Pres & Gen Mgr: R R Langley
SUMMIT ALPHA MINES, Au, Ag, Cu, Pb, Zn
Supt: C G Patterson
Engr: W D Green
Foreman: C D McGovern
Assay: J W Jefferies

ARIZONA MINING CORP
Box 163, Chloride
Sec: F H Luhrs, 17 John St, New York 38, N Y
SAMOA GROUP, Mohave Co, Au, Ag, Pb, Zn, Cu

AROS & RAMIREZ
Wickenburg
Owners: Joseph Aros & Louis Ramirez

ASBESTOS CORP OF AMERICA, Box 328, Globe
Pres: C E Hunziker
VP & Gen Mgr: G B Gulledge
Gen Supt: C H Salmon
REGAL MINES, 47 mi N of Globe, vein, open stoping
Supt: Ralph Henderson
20-TON GRAV MILL
Supt: Newman Pound

ASH PEAK LEASE
Box 208, Duncan
COMMERCE & SHAMROCK MINES, Ag
Gen Mgr: Howard Mottier
Prod: 100-tons

ASSOCIATED MINING CO
Parker
Pres: A C Bureger
RIO VISTA, BILLY MACK, SUE, CAPILANO, MAMMON & LION HILL MINES, Cu, Au
Gen Dir: A O Lofquist
Under dev

ATHLETIC MINING CO
Box 792, Safford
Pres: R F Orr
VP & Gen Mgr: H L Horon
Sec Treas: Ander K Orr
IRON CAP, HEAD CENTER & GRAND CENTRAL MINES, 12 mi NW of Klondyke, irregular vein, shaft, adit, shrinkage & open stoping, Zn, Pb, Cu, Ag, Au
Supt: Albert Bosworth
Foreman: Elton Kidd
Engr: F A Miller
150-TON FLOT MILL
Supt: Alan Hunt

AUSTIN, L C
7951 E Hershey Ave, San Gabriel, Calif
ARIDZONE MINE, Mohave Co, Zn, Pb
Under dev

B S & K MINING CO
3009 N 39th St, Phoenix
Pres: H H Brown
ATLAS MINE, open pit, Cu, Zn
Mgr: A A Barr

BAGDAD COPPER CORP
Bagdad
Pres: J C Lincoln
Gen Mgr: E R Dickie
Gen Supt: J H Cazier
Purch Agt: J W Schulthes
OPEN PIT COPPER MINE, 70 mi W of Prescott
Prod: 3500-tons
Supt: Olaf Hondrum
Foremen: Sam Payne & H T Steward
Engr: G W Colville
Mech Engr: Emmett Foltz
Elec Engr: W D Deacon
3500-TON FLOT MILL
Supt: E G Green
Asst Supt: T A Smith
Foremen: Harry Mullins, Geo Vege, Al Skinner
Met: E S Howell
Assay: J B Campbell

BAILEY, W J
Rt 4, Box 478, Fresno, Calif
TOM THUMB #108 MINE, Pinal Co, Au
Idle

BAKER, EPH
Box 64, Wickenburg
SAND HILL PLACER, Yavapai Co, Au

BANNER MINING CO
1901 First Nat'l Bank Bldg, Oklahoma City, Okla
(See New Mexico listing)
Gen Mgr: A B Bowman, Tucson
MINERAL HILL MINE, Pima Co, Cu, under dev
Supt: E E Bray

BANNER & FOUNTAINHEAD MINE, Kingman
Mohave Co, Au, Ag, Pb, Zn, Cu
Mgr: George F Reed

BARCLAY, ROSS
Washington Camp
STELLA LOUISE MINE, Santa Cruz Co, underground, Zn, Pb, Cu

BARMUTS, BROCK & DUKE
Kingman
Owners: Peter Barmuts, Jr, Richard Brock, Stanley Duke, Earl Duke
SIXTY-THREE MINE, 15 mi from Kingman, Ag, vein dev by shaft

BATTLE SPRINGS ASBESTOS CO Globe
Mgr: Arthur Houser
MINES in Gila Co, underground, Asbestos

BEAR CANYON MINE
Globe
(Leased to R G Robertson)
MINE in Gila Co, underground, Asbestos

BEN LOMOND MINE
Sells
MINE in Pima Co, Pb, Ag
Mgr: J C Howard

BENDER MINE
(Leased to Rupert Byerle & Son, River Store, Nogales)
OPEN PIT MINE 8 mi S of Patagonia, Mn

BIG SPAR MINE
Wickenburg
FELDSPAR MINE, Maricopa Co
Mgr: J A Campbell

BLACK CANYON COPPER CO INC, Box 1531, Phoenix
Pres: J W England, Jr
VP: Jerome Kaye
Sec Treas: Ben Silverman
KAY COPPER MINE, Rocksprings, shaft, Cu, Zn, Au, Ag
(Under dev by option to Shattuck-Denn Mining Co, which see)

BLACK PEARL MINING CO
Box 248, Bagdad
Pres & Gen Mgr: E A Scholz
VP: L K Lindahl
Sec Treas: J H Cazier
BLACK PEARL MINE, 18 mi NE of Bagdad, W
Vein, shaft, adit, cut-fill stoping
Supt: K K Puumala
Prod: 20-tons

BLUE SKY MINING CO
Box 387, Bouse
(Leasing from Coronation Mining Co, which see)

BONANZA MINING CO
Wenden
Pres & Gen Mgr: R R MacDonald
VP: Rolland Moore
Sec Treas: Kathryn M Moore
Purch Agt: Jack E Brown
Geol: Burton Rose
BONANZA MINE, 7 mi NE of Wenden, Cu, Au, under dev
Supt: Roy Wisinan
BONANZA PILOT MILL, 1/2 mi S of Wenden, under dev
Supt: Marvin G Milner

BOTT, GEORGE H
Box 58
BOTT MINES, Aravaipa mining dist, Klondyke, Zn, Pb, Ag, Au
Under dev

BOYD & FORTNER
Wickenburg
Partners: Bert Boyd & B H Fortner
LUCKY MICA #1 MINE, 11 mi S of Wickenburg, Spodumene, Lepidolite

BRAATHEN, ARNT T
Box 22, Amado
Braathen Group, Santa Cruz Co, Zn, Pb

BRADY, L R
149 W McArthur St, Tucson
HILL TOP CLAIM, 7 mi E of Hayden, vein under dev, Cu, Au, Ag

BRINT, M W
Cleator
GOLDEN TURKEY GROUP, Yavapai Co, Au, Pb

BROWN, J W
155 Pasadena St, Mesa
EL CAPITAN MINE, Gila Co, Ag
Idle

BROWN, R L
Box 1783, Nogales
KANSAS MINE, Washington Camp, 20 mi S of Patagonia, irregular orebody, shaft, open stoping
Prod: 15-tons
Supt: Alex De La Ossa
Engr: J Nunez

BUCKEYE MICA CO
Box 416, Buckeye
Pres: Walter L Tocco
Sec: H G Smith
BUCKEYE MINE, 4 1/2 mi S of Buckeye
PEEPLESS VALLEY MINE, 12 mi NW of Peeples Valley
Underground, open pit, Sericite, Muscovite, Be
Supt: Robert Burns
100-TON GRAV MILL
Foreman: Wayne Watts

BURNEY MINES, INC
2422 N Balboa Ave, Tuscon
Pres & Gen Mgr: R A Burney
Sec Treas: Lilia Burney
STOVE LID & AMPITHEATER MINES
Vein, shrinkage, open stoping
FLOT MILL at mine

BUSH & MERRILL
Klondyke
FAIRVIEW MINE, shaft, Pb, Ag, Au
Supt: Charles Sammis

BYWATER, CAL
Box 1679, Globe
ROUND TOP #6 & 7, Gila Co, Au
Idle

CALARI MINING CO
408 Kress Bldg, Long Beach Calif
Pres: L F Albrecht
Sec Treas: Edward Shaffer
RUTH MINE, Box 941, Prescott
6 mi S of Prescott, vein, shaft & adit with open stoping, Zn, Pb, Cu, Ag, Au
Supt: W F Bullis
Foreman: V H LeMay

CALIFORNIA STEEL PRODUCTS CO, Richmond Calif
Treas: C F Fannin
SILVER BELL OF COLUMBIA MINES, Pinal Co, Pb

CAMP B COPPER MINE
Box 392, Wickenburg
Pres & Mgr: Emmett Nutter
Sec Treas: Hollis B Gray
VPs: John Perkins, L C Miller
MONTE CRISTO & HALE GROUPS, 11 mi NE of Wickenburg, Au, Cu
Purch Agt: George Criswell
Supt: Edwin Kephart
Under dev

CAMP BIRD MINE
Wagoner
CAMP BIRD MINE, 5-7 mi SW of Wagoner, underground, Au, Ag, Pb
Owner: Harold B Simm

CAMPBELL, GEORGE W
Box 701, Salome
BLUE EAGLE or BUNKER HILL MINE, Yuma Co, Au

CAMPBELL, S T
Box 1841, Prescott
COLDWATER MINE, Yavapai Co
Under dev

CANADA DEL ORO MINE
Oracle, Tungsten
Mgr: James McAvoy
Under dev

CARLOTTA COPPER CO
530 W Latham, Phoenix
Pres: John L Alexander
CARLOTTA MINE, 15 mi W of Miami, open pit, Cu

CASA GRANDE PERLITE CO
Casa Grande
Pres: C M Vaugn
VP: Guy Gilbert
Treas: M C Jensen
Mill Supt: H H Matchett
Prod: 48-yds

CASTLE DOME COPPER CO
(See North Eastern listing)
Box 100, Miami
MINE 10 mi W of Miami, open pit, Cu concentrate
Supt: J C Van de Water
Geol: J E Fowells
Mine Engr: C B Hostetler
Elec Engr: Tom Williams
12,000-TON FLOT MILL
Supt: R L Mountjoy
Met: G H Curtis
Assay: G R Warren

CATOCTIN MINE
Prescott
MINE in Yavapai Co, Pb, Ag
Mgr: C W Gabrielson

CEDAR TALISMAN CONS MINING CO, 21 Stock Exchange Bldg, Salt Lake City, Utah
Pres & Gen Mgr: J Walters, Jr
Sec Treas: A J Selander
FRENCH LILY MINE, Box 1548, Prescott, underground, Au, Ag, Cu, Zn, Pb
Supt: R R McLeod
60-TON FLOT MILL

CENTRAL EUREKA MNG CO
(See Calif listing)
LOMA PRIETA MINE, Prescott, vein, shaft with cut-fill & open stoping, Cu
Prod: 200-tons

CENTROID CONS MINES
Box 312, Salome
Pres: W B Harris
VP: R W Harris
Sec: V J Harris
Cons Engr: E W Mills
CENTROID, JUBILEE, HANCOCK, & BLACK HAWK MINES, 10 mi N of Salome, disseminated orebody dev by shaft
Prod: 20-tons

CHANCE MINE
Box 137, Elfrida
Mgr: J F Rydbaum
MINE in Cochise Co, underground, Pb, Ag

CHARLESTON LEAD MINES
Box 347, Tombstone
Gen Mgr: C H Suiter
MARY JO & CHARLESTON MINES, 7 mi SW of Tombstone, vein, shaft with square-set stoping, Pb
20-TON GRAV WASH PL

CHEMI-COTE PERLITE CORP
Box 5187, Phoenix
Pres: O T Ball
VP: L L Young
MARY T & SANDY #2 CLAIMS, 3 mi SW of Superior, open pit
Supt: J A Wellington
Cons Chem: L A GeBauer
CRUSHING PL, 100-tons

CHILSON, RICHARD E
Box 2729, Tucson
KING EXILE & SOUTH END MINES, 18 mi E of Sahuarita, underground, Cu, Ag
Prod: 200-tons monthly

CLARK, E
Miami
GIBSON MINE, 9 mi SW of Miami, vein, shaft, adit, with cut-fill, Cu

CLARK, JOHN A
Box 659, Globe
VINDICATOR MINES #1, 2, 3, 4, 7, Gila Co, under dev

CLARKE, PHIL J
Box 452, Nogales
BIG STEVE MINE, Santa Cruz Co, under dev

CLAYTON, W H
Mesa
ROSECRANS MINE, under dev, Au

COCREHAM, STEVE
Box 679, Globe
LEAD QUEEN #1 & 2, Pinal Co, Pb

COHEN TUNGSTEN MINE
59 E Madison Ave, Chicago, Ill
Pres: A G Cohen
Gen Mgr: F W Clark
MINE, 14 mi from Wilcox, underground, placer

COLBURN, E A JR
Box 153, Congress
CONGRESS MINE, 3 mi N of Congress Junction, vein, shaft with cut-fill stoping, Au, Ag, W

COMSTOCK EXT MNG CO
408 N 7th Ave, Phoenix
Pres: John Evans
Sec: B T Dick
DOUGHBOY GROUP MINE, Gila Co, Cu, Zn
Supt: Tony Trojanovich
Engr: Henry Nichols

CONS COPPERMINES CORP
(See Northeastern & Nev listings)
Exploration on Lone Star Mine, 10 mi E of Safford
Supt: John Hope

CONS FELDSPAR CORP
Box 229, Kingman
Pres: R W Lawson
Gen Mgr: Ed Bone
OPEN PIT MINE, Feldspar, Silica
80-TON GRINDING PL
Supt: L D Gregory
Foremen: Paul Hodges & S B Wooten
Assay: E W Koenig
Purch Agt: Paul Willis

COPPER BELT MNG CO
Aguila
Mgr: H K Thomas
MINE 20 mi S of Aguila, Cu

COPPER BUTTE MNG CO
Box N, Ray
Mgr: C F Mitchell
COPPER BUTTE MINE, 7 mi W of Ray, open pit, Cu

COPPER HILL MNG CO
Box 991, Globe
Pres: T R Black, Box 46, Tipp City, Ohio
Sec & Gen Mgr: L O Goodman
SUPERIOR & BOSTON MINES, 4 mi NE of Globe, vein, shaft with open stoping, Mn, Cu
Supt: Phil Morse
Engr: W S Bradbury

COPPER ROSE MINE
Oracle, Cu
Mgr: R A Burney

CORONADO COPPER AND ZINC CO, 1206 Pacific Mutual Bldg, Los Angeles 14, Calif
Pres & Gen Mgr: R W Moore
VP: H T Mudd
Purch Agt: A L Davidson
REPUBLIC MINE, 6 mi N of Dragoon, underground, Zn, Cu
Mgr: Fred E Gray
Foreman: B B Gibbens
Engr: Hugo Miller
Geol: Arthur Baker III
200-TON FLOT MILL
Supt. L D Yundt
Assay: W O Hamilton

CORONADO MINES, INC
(See South Central listing)
RED MT, BUENA VISTA, GOLDEN ROSE & WASHINGTON MINES, Box 659, Nogales, Cu, Mo, W, Pb, Au, Ag, Pyrites
Irregular vein, adit with shrinkage & open stoping
Foreman: Howard Pittenger

CORONATION MNG CO, INC
Box 387, Bouse
Pres: Charles Milton
VP: L A Linebaugh
Sec: H S Schneider
Treas: E O Northbrook
CORONATION MINES #1-74, Au, Ag, Cu
(Leased to Blue Sky Mng Co)

COYOTE HOLE MINE
Sells
TUNGSTEN MINE in Pima Co

CRISS CROSS MINE
Sahuarita
MINE in Pima Co, Pb, Ag
Mgr: Russell Todd

CROWN POINT MNG CO
Box 691, Globe
Pres & Gen Mgr: C F Moores
RAY MINE, 35 mi SW of Globe, underground, Pb, Ag
Engr: R E Douglas
FLOT GRAV MILL

DANENHAUER, MAT & ASSOC
Clifton
BLACK ROCK MINE, 2 mi N of Clifton, Mn, under dev

DAVIS, DAVIS & KNAPP
Casa Grande
COPPER RIBBON & COUNTRY BOY CLAIMS, Sheridan mng dist, open pit, Cu, Au, Ag, U

DE LA FOUNTAINE MINE
Kingman, Pb, Au, Ag
Mgr: A W Smith
MINE, 14 mi N of Kingman, vein dev by adit with open stoping

DE LA OSSA & R L BROWN
Box 182, Tombstone
DOUBLE STANDARD MINE, Santa Cruz Co, underground, Zn, Pb, Cu
EMPIRE MINE, Shaft, Zn, Pb, Cu
Prod: 100-tons monthly

DEL PASCO MNG CO
Crown King
Owners: DeZee & Campbell

Mgr: Hugh F Campbell
DEL PASCO MINE, 7 mi NW of Crown King, underground, Au, Pb, Ag, Zn

DESERT LEAD CO
Yuma
Pres & Mgr: W D Morrison
RIALTO MINE, Yuma Co, underground, Pb, Ag
300-TON MILL

DORSEY & GREGERSON
108 Perkins St, Nogales
CONCEPCIONES MINE, Pima Co
Under dev

DUQUESNE MINING CO
c/o A R Byrd Jr, 721 S 6th Ave, Tucson
DUQUESNE MINES, Santa Cruz Co, Cu, Pb

DYE & BATHRICK
Box 1069, Kingman
BORIANA MINE DUMP, 15 mi NE of Yucca, W
COPPER WORLD MINE, Yucca, Ag, Zn, Cu, Pb
(Leased to Mt States Mng Co)
TIN CUP MINE, Kingman, Au
Under dev
100-TON GRAV FLOT MILL
Under construction

E M M MNG & DEV CO
123 N Norton St, Tucson
Pres: Frank McCargor
Sec: R McBarnes
ANTELOPE MINE, Sahuarita, Pb
Mgr: H C Ertel

EAGLE-PICHER CO, MINING AND SMELTING DIVISION
(See South Central listing)
VP & Gen Mgr: Elmer Isern
WESTERN OPERATIONS
Box 231, Tucson
Mgr: Grover J Duff
SAN XAVIER MINE, Zn, Pb
SAHUARITA MILL, 500-tons
Mine Supt: Leon F Bayer
Mill Supt: V W Winters

EMERALD ISLE COPPER CO
Kingman
MINE in Mohave Co, Cu
Owner: C F Weeks
400-TON LEACHING PL
Idle

EMPEROR-DUCHESS MINES CO, INC, Fairfield, Idaho
Pres: Ben Lasswell
VP: Chas Fuller
Sec Treas: Roland Baldwin
Dir: Laurence Green, Sells
MINE at Sells, Cu, Ag
Supt: Myrl Green

EPLEY, ED & W A HICKS
Portal
SILVER HILL GROUP, Cochise Co, Pb, Idle

ERICKSON, GEORGE
Box 2231, Warren
LUCKY SWEDE MINE, 6 mi E of Lowell, shaft under dev

ERKLANS, JOHN
Box 1022, Hayden
OLD SAMPLE MINES, Pinal Co, Ag

ESCAPULE, JOE M
Box 243, Tombstone
GARNET #1-12, Cochise Co, dev

F H & R MINING CO
Arivaca
MINE in Pima Co, W
Mgr: Harold Ferrin

FARO BANK GROUP
Box 769, Tucson
Owner: S B Owens
MINE at Sells, Au, Idle

FERNSTROM OPERATING CO
Box 51, Ruby Star Rt, Tucson
Opers: Ray & Lester Fernstrom
FERNSTROM CLAIMS, N of Dragoon, W
LAS GUIJAS MINE, 6 mi NW of Arivaca, W, Au
Mgr: Harold Ferrin
FERNSTROM MILL, Tucson

FINLEY, R C
195 E Mesquite St, Globe
BOBTAIL GROUP, Gila Co, Cu, Ag, Pb, Zn, W
GIBSON MINE, Cu

FISHBACK & GOETZ
Hayden Junction
KULLMAN-McCOOL MINE, Banner dist, Cu, Pb, Idle

FLUORSPAR PRODUCERS CORP, 9501 Washington Blvd, Culver City, Calif
Pres: A W Fredrickson
VP & Gen Mgr: Joffre Marcil
Sec Treas: W M Jacobs
LONE STAR FLUORSPAR MINES, 11 mi SE of Benson, underground
Supt: J Marcil
Asst Supt: J Donohoe
Prod: 10-tons

FONTAINA MINE
Salome
MINE in Yuma Co, Au
Mgr: G B Franks

FORBES, A W & D F
116 Washington St, Tucson
FORBES MINE, Pima Co, Zn, Pb

FOUNTAIN HEAD MINE
Kingman, Zn, Pb
(Leased to George F Reed)

FOUR X MINING CO
Rt 1, Box 472, Duncan
Mgr: J C Kennedy
BLUE MT MINE, near Portal, Pb

FOURTH OF JULY MINE
Duncan
Mgr: R T Ellis
Under dev, Fluorspar

FRITZ, OTTO L
Health Dept, Tucson
RICHARD & RICHARD #1MINE, Gila Co, Cu, Idle

GALBRAITH, ROY
426 N Robson, Mesa
TREASURE CHEST MINE, Maricopa Co, under dev

GALLAGHER VANADIUM & RARE MINERALS CORP
Box 77, Tombstone
Mgr: J B Gallagher
BRONKOW MINE, near Tombstone, underground, Pb, V, Au, Ag

GEMMILL, MARK
Prescott
SENATOR GROUP MINE, Yavapai Co, Zn, Pb

GEROLD, CHARLES & FRED
S 6th Ave, Tucson
CALOMINA MINE, Pima Co, underground, Pb, Ag, Cu
Owner: Antonio Zambonini

GIACOMA BROS
Box 546, Tombstone
Mgr: A P Giacoma
INTERVENOR MINE, Au, Ag, Idle
SAN PEDRO MINE, Au, Idle

GLOBE-LOS ANGELES MNG CO, Globe
Pres: Henry Mulryan
CANADIAN GROUP, 40 mi N of Globe, Asbestos

GOLD NOTE MINE
Wagoner
Operator: R E Logan
MINE in Yavapai Co, Pb, dev

GOLDEN CROWN MNG CO
Crown King
Pres & Gen Mgr: S P Silverman
COUGAR, LYDIA & TIGER MINES, veins dev by shaft & winze
Pb, Zn, Cu, Ag, Au
Supt: H B Salisbury

GOLDFIELD MINES, INC
Mesa
Owner: Hugh Nichols
Mgr: T R Russell
GOLDFIELD MINE, NE of Mesa, open pit, Au
125-TON CYANIDE MILL

GOMEZ, CY & MANUEL
Morenci
BELL GROUP, Greenlee Co, Au, Ag
(Leased from Dover Copper Co)

GOOD ENOUGH MINING & MILLING CO, 650 S 4th Ave, Tucson
MINE near Arivaca, vein dev by shaft, W
24-TON GRAV MILL
Purch Agt: J A Zappia
Supt: G A Alapradini

GOODWIN MINING CO
Box 248, Bagdad
Owner: Ernest R Dickie
COPPER KING MINE, 7 mi S of Bagdad, irregular orebody, shaft, cut-fill stoping, Zn, Cu
(Leased to Scholz & Cazier)
COPPER QUEEN MINE, underground, 25-tons
(Leased to Mike Lawler, Hillside)
OLD DICK MINE, underground
(Leased to Edgar Kellis)
PINAFORE & CUPRIUM MINES, under dev, Cu, Pb, Zn, Au, Ag

GRACE MINES
Portal
Pres, M E Schad
VP: Archie Spain
Operator: J L Schad
GRACE MINES, vein under dev

GRANITE BUTTE MINE
Chloride
Owners: Elmer, Harold & Robert Thorsten
MINE under dev, Ag, Pb

GRANNIS, FRANK
Chloride
ATWATER KENT GROUP, Zn, Pb

GRIFFITH, BEN
675 S Duncan Ave, Los Angeles 22, Calif
McCRAKEN MT GROUP, 67 mi S of Kingman, underground, Pb, Ag
(Leased to Albert & Harry Bauer)
FLOT MILL

GROVE & SONS MINING CO
202 N Pleasant St, Prescott
Pres: A S Brown
Mgr: H K Grove
ORO FLAME & OHIO MINES, Yavapai Co, underground, Au, Ag, Pb

GROZIER, THOMAS F
Box 787, Kingman
AMERICAN NETTIE MINE, Mohave Co, under dev

GYPSUM MINE
Winkleman
Mgr: J S Tillman

H & H MINING CO
Yucca
Gen Mgr, Earl Heath
MARY NEVADA MINE, underground, Ag, Pb, Au
Foreman: Sheldon Heath
40-YD GRAV OPERATION
Supt: Ray Farr

H & M MINING CO
Crown King
Partners: C F Moores, F G Holmes
GLADIATOR MINE, 3 mi N of Crown King, underground, Au, Ag, Cu, Pb, Zn
Foreman: Harrison Smith
20-TON FLOT MILL

HAGEY, J H & J D
Box 205, Chloride
J & J CLAIMS, 19 mi E of Chloride, underground, Au, Ag, Zn, Pb, Cu
HAGEY GROUP, 5 mi from Chloride, underground, Au, Cu
D & H GROUP, 10 mi E of Chloride, vein under dev by shaft & adit, Zn, Pb, Ag, Au, Cu, Mn

HARPER MINE
Star Rt, Patagonia, W
Mgr Dean Mort

HAUGHT, SAMUEL A JR
Box 43, Young
WILD BULL MINE, Gila Co, dev

HELVETIA MINING CO
Box 926, Tucson
Owner: R B Blankenship
42 CLAIMS, underground & open pit, Ag, Cu, W, Mo, dev

HENDERSON, MRS A S
Patagonia
MINERAL MINE, Santa Cruz Co

HERRAN, JAMES JR
Box 646, Superior
LAKE SUPERIOR & ARIZONA GROUPS, Pinal Co, Au

HIGGINS, F L
Box 84, Willcox
SENIKA MINE near Cochise Stronghold, Au, Pb, Ag, dev by shaft, adit

HILL, FRANK
Box 8A, Ruby Star Rt, Tucson
ARIZONA #3 MINE, Pima Co, Ag, Pb

HILLSIDE INVESTMENT & MINING CO, 2801 Oracle Rd, Tucson
Mgr: C F Weisman
GRAND VIEW MINE, Pinal Co, underground, Au, Ag

HILLSIDE MNG & MILLING CO
Bagdad
Pres: J C Lincoln
VP & Gen Mgr: E R Dickie
Sec Treas: George Colville
Acting Gen Mgr E G Green
Gen Supt: Edgar Kellis
HILLSIDE MINE, Au, Ag, Pb, Zn
Supt: E E Snellenberger
250-TON FLOT MILL
Supt: Mark Campbell
Assay: J B Campbell

HILTON, E P
Box 1308, Tucson
STATE OF MAIN GROUP & LONE MT MINE, 38 mi SE of Tucson, shaft, adit, Pb, Ag, Au, Zn
15-TON GRAV MILL, Idle

HORSE SHOE MINING CO
235 Adams Hotel Bldg, Phoenix
Mgr: J D Merrill
HORSESHOE MINE, 10 mi NE of Safford, vein, shaft, Idle

HULSEY & HALL
c/o Geo Hall, San Simon
DOUBLE EAGLE MINE, Cochise Co, Au, Idle

HURLBUT, W C
Breaterville
SILVER LEAD & QUEBEC MINES, Pima Co, dev

HUSTED, WORD & DAVIS
Box 589, Globe
MORNING STAR #4 MINE, Stanley dist, Cu, Idle

INDIAN SPRINGS MINE
Globe
MINE in Gila Co, Asbestos
Mgr H R Scott

INSPIRATION CONS COPPER
(See North Eastern listing)
COPPER MINE, Inspiration, shaft, block-caving & open pit
Prod: 13,500-tons
Supt: J R Watts
Asst Supt: B B Whitney
Engr: C D Huffine
Foreman: C O Cunningham
Pit Foreman, H R Burch
FLOT MILL, LEACH PL, ACID PL & ELECTROLYTIC REFIN
Mill Supt: H F Adams
Mill Foreman: S E McNeil
Leach Pl Supt: C B Kettering
Leach Pl Fore: A J Gould
Acid Pl Fore: W R Dinninger
Master Mech: E L Hart
Engr, Power Pl: T E Tizard

INTERNAT'L MNG EXCHANGE
c/o J B Johnson Jr, Box 418, Glendale
MYSTERY MINE, Yavapai Co, Idle

INTERNATIONAL SMELTING & REFINING CO, Miami
Supt: Harold Faord
Ore Buyer: Clifton E Smith
3,000-TON CUSTOM Cu SMELTER

J L MINING CO
Bumble Bee
Mgr: W S Ballard
MINE in Yavapai Co, undergrnd, Au

JAGUAYS, D W CO
1219 S 19th Ave, Phoenix
Pres & Gen Mgr: D W Jaguays
REGAL & CANADIAN MINE LEASES, Box 328, Globe, 47 mi N of Globe, vein mined open stoping
Regal Supt: Ralph Henderson
Canadian Supt: Clyde Salmon

JAMES MINE
Box 415, Bisbee, W
(Leased to F A Montgomery)

JOHNSON MINING CO
Box 19, Kelvin
Mgr: A H Johnson
BLACK COPPER GROUP, Pinal Co, Cu

JOHNSON, ROSE H
Box 661, Salome
HARQUA HALA EXT GROUP, Yuma Co

KELLIS, EDGAR
Bagdad
OLD DICK MINE, Yavapai Co, underground, Pb, Zn, Cu
(Leased from Goodwin Mining Co)

KENNECOTT COPPER CORP
(See North Eastern listing)
RAY MINES DIVISION, Ray
Gen Mgr: A P Morris
Asst Gen Mgr: H J O'Corroll
Ch Clerk: H L Herrimann, Hayden
Asst Purch Agt: N E Guyer, Hayden
MINING, Ray
Open pit & underground, Cu
Gen Foreman: Ernest Jenkins
Mast Mech: A L Dickerson
Ch Elec: L J Miller
FLOT MILL, Hayden
Supt: F J Tuck
Asst Supt: J L Stevens
Met Engr: G P Sewell
Mech Supt: J D Sullivan
Mast Mech: F M Hoskins
Ch Elec: C W Dutton

KENNEDY, JAMES O
Box 9, Kirkland
PORTLAND GROUP, Yavapai Co, Au

KIRKPATRICK, W H
St Michael Hotel, Prescott
BODIE MINE, Yavapai Co, Pb

KNIGHT, SAM MNG LEASE INC
Winkelman
Pres: Frank P Knight, Jr
Sec: Roland H Knight
Treas: Sam Knight
CHRISTMAN MINE, 9 mi N of Winkleman, underground, Cu
100-TONS FLUXING LIME ORE

KOHL, GEORGE
Box 1593, Globe
RENOLDS ASBESTOS MINE
Supt: Floyd Brown
Owner: Robert Wells, Tulsa, Okla

KYLE ASBESTOS MINES OF ARIZONA, INC, Globe
Owner: Roger V Kyle
Underground, Chrysotile asbestos
Prod: 2 to 5-tons

LARSON, EDWIN MINES
Box 101, Elfrida
Owner: Dr Edwin Larson, Los Angeles
Mgr: Robert T Mitcham
SCRIBNER MINE, undergrnd, Ag, Pb, Au
Prod: 250-tons
(Leased to Manhattan Cons Mng Co)
MOUNTAIN QUEEN MINE, Swisshelm dist, Pb, Zn

LAST CHANCE MINE
c/o E Haynie, Box 343, Douglas
MINE in Cochise Co

LEAD & ZINC CORP OF AMER
Box 606, Globe
Pres: Grady B Gulledge
VP: J B Williamson
Gen Mgr: Ray Pointer
BEN HUR MINE, 15 mi NW of Klondyke, Pb, Zn, Cu, Ag, vein div by shaft, adit, square-set stoping

LENNOX-HUGHES SYNDICATE
Box 407, Seligman
Mgr: Harry C Lennox
LONE JACK & BLACKFOOT MINES, Mohave Co, dev

LEON, MILTON
208 Wright Bldg, Tulsa 3, Okla
UNCLE SAM MINE, Box 659, Nogales, 5 mi NE of Nogales, vein, shft with shrinkage stoping, Au, Ag, Pb

LeROY MINE
Box 15, Dos Cabezas
Operator: C W Dorsey
Au, Ag, Pb, Zn

LEVY, BEN
Box 843, Kingman
LEAD PILL MINE, Owens dist, Pb

LIPPINCOTT, RD, LB & JR
Box 642, Salome
BIG BOY MINE, Yuma Co, Pb, Au, Ag

LITTLE ANNIE MINE
Washington Camp
MINE, Santa Cruz Co, Zn, Pb, Cu
Mgr: Maynard Perkins

LITTLE DOMES MNG CO
Pres: Fred T Smith, 430 S Broadway, Los Angeles, Calif
SONORA GROUP, Yuma Co, dev

LOMALINA MINERAL DEV CO
Tombstone
Gen Mgr: Freeman Lomalina
Asst Mgr: Robert LeFever
SAN JUAN & EMERALD MINES, 16 mi NE of Tombstone, Pb, Ag, Au
(Leased from Johnathan Gordon)
100-TON FLOT MILL

LONE PINE MINE
Prescott
Operator: Fred Gibbs
MINE in Bug Bug dist, Cu

LONE STAR MINES, INC
702 19th Ave, Safford
Operator: Albert Spaulding
LONE STAR MINE, 10 mi NE of Safford, underground
(Third of property optioned to Cons Copperminas Corp, which see)

LONG, A E
1021 W 10th St, Los Angeles, Calif
WHY NOT, GOLD & CLIPPER GROUPS, Yuma Co, Idle

LOOFBORO, L C
Box 53, Ruby Star Rt, Tucson
SILVER BELL MINE, Arivace underground, Ag, Pb

LUCAS, C L
Wickenburg
B O A MINE, Yavapai Co, Cu

LUCKY LYMAN MNG CO
Yuma
81 MINE in Yuma Co, Pb, Ag, dev
Mgr: Lyman Wall

LUCKY NO 3
Lordsburg, New Mexico
FLUORSPAR MINE, Greenlee Co
(Leased to Forrest & McCabe)

LUCKY TIGER COMBINATION GOLD MINING CO
Parker
Mgr: E J Stanley
EMPIRE ARIZONA MINE, Yuma Co, underground, Cu
Supt: W W Harriett

MAGMA COPPER CO
Superior
Pres: A J McNabb
VP & Treas: H E Dodge
VP & Gen Mgr: W P Goss
Asst Gen Mgr: Darrell Gardner
Purch Agt: Frank Sarver
Sec: R C Bonebrake
Asst Sec Treas: Gus A Mrkvicka
MAGMA MINE, N of Superior, undgrnd Cu, Zn, Ag, Au
Supt: J F Buchanan
Asst Supt: John Draeger
Foreman: C Tomerlin
Ch Engr: J F Flanagan
Mech Engr: T G Botkin
Acting Mine Supt: C B Foraker
Master Mech: Howard Johnston
Ch Elec: L D Curtis
Audit: W J Swanson
1500-TON FLOT MILL
Supt: Halder Rex
Met: F T Davis
Assay: W W Simon
1500-TON SMELTER
Supt: E J Caldwell

MAGIC MINE
Wenden, Au
Operator: E J Johnson

MAGMA KING MANGANESE MINE
Superior
MINE in Pinal Co, Mn, Ag
Mgr: Ralph Pomeroy

MAIN, F L
621 Curley, Prescott
REBEL MINE, 6 mi SW of Humbolt, Au, Ag, Pb, Zn
Mgr: Bill Snyder

MANGANESE KING MNG SYN
Box 335, Bouse
Pres: R N Doyle
VP & Sec: Harrison Doyle
Gen Mgr: L A Aplington
MANGANESE KING MINE, 35 mi NE of Bouse, open pit, dev

MANHATTAN CONS MINES DEV
Bagdad
Pres: J F McColloch
SCRIBNER MINE, Yavapai Co, Cu, Zn
Mgr: K L Erickson
(Leased from Edwin Larson Mines)

MANIFEE, JACK
Rock Springs, Ag
GOLD STANDARD GROUP, Yavapai Co

MARIN, ALFONSO A
Box 71, Winkelman
JAVONCILLO MINE, Gila Co, Au

MARK TWAIN MINING CO
c/o Ike W Kusisto, Box 722, Salome
MARK TWAIN MINE, Yavapai Co, Ag

MARSTELLER, GROVER
Box 1487, Nogales
HERMOSA MINE, Santa Cruz Co, Ag
MINA PRIETA MINE, Mn, dev

MARY COOPER MINE
Cleator
MINE near Mayer, Cu, Au, Idle
(Leased by J H Christensen)

MARY G MINE
Box 49, Ruby Star Rt, Tucson
Pres: H D Nygaard
VP: H G Worsley
Sec: J Burmeister
Pb, Ag, Cu, Hg, Idle

MAUDINA MINE
Oracle
MINE, Pinal Co, W
Mgr: Carl B Lancaster

MAYHEW MINING CO
Yuma
Mgr: Jim Mayhew
BIG JIM MINE, Castle Dome dist, Idle
Pb, Ag, Au, Zn, Cu

McCARRELL, C A
Sanders
SANDERS MINE, Apache Co, open pit, Bentonite
Prod: 14,000-tons monthly

McFARLAND & HULLINGER CO
Bagdad
Owners: Setland McFarland & Sid Hullinger, Salt Lake City, Utah
BOSTON-ARIZONA MINE, near Skull Valley, Cu, Pb, Zn
OLD DICK MINE, Bagdad, Zn, Cu, Pb
Prod: 2000-tons monthly
Mgr: K L Erickson
LITHIUM CLAIMS near Wickenburg, dev
Foreman: Bert Boyd

MERLO MICA MINING CO
Box 1111, Kingman
Gen Mgr: H A Lackey
MICA HILL MINE, Moss Canyon, open pit, mica, dev
Supt: B L Gamel

METATE ASBESTOS CORP
Box 1506, Globe
Pres: C R Neal
VP & Gen Mgr: J L Neal
Sec Treas: R C McNabb
APACHE MINE, San Carlos Res, bedded orebody, adit, cut-fill stoping
Supt: Jack L Neal
APACHE MILL, at mine, 4-tons prod
Supt: Charles Ross Neal

METEOR SILICA CORP
Winslow, Box 191
Pres: W A Moeur, Phoenix
MINE 18 mi W of Winslow
Mgr: Earl E Pomeroy

MEYER, JOHN L
Peoria
GOLD MT MINE, undergrnd, Au, Ag

MEYER, WALTER
Box 150, Kingman
TELLURIDE CHIEF MINE, Mohave Co

MIAMI COPPER CO
(See North Eastern listing)
Box 100, Miami
MINE underground, Cu, Mo
Supt: W F Distler
Foreman: E G Williams
Geol: J E Fowelis
Engr: J B Fletcher
Mech Supt: J J Luchessa
Master Mech: F J Martin
18,000-TON FLOT MILL
Supt: J W Smith
Met: C H Curtis
Assay: G R Warren

MINERAL MT M & M CO
330 E 14th St, Tempe
Pres: C M Miller
VP & Gen Mgr: L L Boyer
GORHAM-HALL GROUP, 20 mi SW of Superior, Pb, Ag, Zn, underground dev
WOODPECKER MINE, Pinal Co, Au, Ag Pb, dev
SILVER QUEEN GROUP, 23 mi SW of Superior, Pb, Ag, Idle

MINGUS MT MINING CO
Jerome
MINE, N of Jerome, Idle
Supt: Paul Park

MITCHELL, J D
Box 54, Sasabe Star Rt, Tucson
SILVER SHIELD MINE, Pima Co, Ag
Mgr: John A Folk

MOHAVE MINING CO
Professional Bldg, Boulder City, Nev
AH-VE-HA CAIMS #1-4, Yuma Co, Au
(Leased to D M MacCornak)

MONEY METALS
Globe
MINE, Gila Co, Zn, Ag, Au
Mgr: Louis Winn

MONTANA MINE
Ruby
Owner: Hugo W Miller, Nogales
MINE underground, Au, Ag, Cu, Pb, Zn

MONTANA-ARIZONA MNG CO
Gila Bend, Cu, Ag
Mgr: C R Anderson

MORENO, RAMON G
Box 503, Patagonia
Pres & Gen Mgr: Jim Magaffe
SAN ROMON MINE, 14 mi NE of Patagonia, shaft, block-caving & shrinkage stoping, Pb, Cu, Zn, Ag, Au

MT STATES METALS CO
Yucca
Pres & Gen Mgr: G A Freeman
COPPER WORLD MINE, 15 mi NE of Yucca, Cu, Zn, shaft, adit
COPPER WORLD MILL, 75-tons
(Leased from Dye & Bathrick)

NASH MINES
Patagonia
Pres: James Nash, Austin, Tex
Gen Mgr: D C Gilbert
ANNE, ESTELLA LOUISE, MAINE, CALIFORNIA & SMUGGLER CLAIMS, Zn, Pb Cu, Ag, Prod: 850-tons monthly
BONANZA MINE (Leased to Bonanza Mining co)
DUQUESNE MINE (Leased to Duquesne Mining Co)
HOLLAND MINE (Leased to De La Ossa and Brown)
KANSAS MINE (Leased to R L Brown)

NAVAJO URANIUM CO
Cortez, Colo (Box 608)
Pres: R O Dulaney, Jr
VP & Gen Mgr: G R Kennedy
Sec Treas: Edmund Key III
Met: Oscar Fischer
COVE MINES, Apache Co, irregular orebody, square-set stoping & open pit
Prod: 60-tons, U, V
Supt: Wilbur Jannacka
Foreman: W H Peters
Engr: Tom Valente
Shift Boss: Chris H Jones
SAMPLING PL, Shiprock N. M.
Prod: 300-tons

NELSON & ULICH MINE
Mayer
Operator: Walter Nelson
PLACER, Yavapai Co, dragline, Au
Idle

NEZIK, JOHN
Cleator
GRAY GOOSE MINE, Yavapai Co, Au

OLD SOLDIER MINE
213 N Mt Vernon, Prescott
Mgr: J Shull
MINE, dev, Au, Ag, Cu, Pb, Mo

OLIVERIO, JOE
Box 1425, Globe
RED HILL MINES #1-16, Gila Co, Cu

OLSON, ROBERT M
Box 1054, Superior
SILVER KING MINE, Pinal Co, Dev

ORO BLANCO MINES
Box 61, Ruby Star Rt, Tucson
Gen Mgr: T J Anderson
ORO BLANCO & CHOCTAW MINES, Santa Cruz Co, Zn, Pb
30-TON GRAV MILL

ORR & DICKIE
Rt 1, Box 390, Prescott
Partners: Jack Orr & E R Dickie
CASH MINE, 12 mi S of Prescott, Au, Ag, Cu, Pb, Zn

ORTIZ, JESUS
Box 8, Ruby Star Rt, Tucson
VIVIENNE MINE, Pima Co, Idle

OSBORNE, HARRY M
Parker
SUE MINE, 5 mi N of Parker, underground, Au, Cu
7-TON MILL

PARADISE MINES CO
Patagonia
Pres: Harry Levy
VP: Ray Levy
Gen Mgr: Cecil H Smith
Gen Supt: Robert Bordley
MOWRY MINE, 11 mi S of Patagonia, underground, Zn, Pb, Ag, Mn, dev
Geol & Engr: L H Dydes

PARIA COPPER CO
Kanab, Utah
Pres & Gen Mgr: F A Heaton
VP: Adrian H Heaton
BROWN DERBY, LITTLE BUCK, BLACK BEAUTY & SOUTH PHANTOM, 35 mi SE of Fredoniak, underground & open pit, Cu, Ag, Au
Engr: J Mark Holmes
Idle

PASELK, W S
Blythe, Calif
COPPER PRINCE GROUP, Yuma Co

PAUL LIME PLANT
Paul Spur
Gen Mgr: Alfred Paul, Jr
Asst Mgr & Engr: H S Dahlman
Gen Supt & Purch Agt: John Van Hooten
MINE, 11 mi W of Douglas, Lime, Lime & Silica flux, Limerock aggregate
Prod: 700-tons
Foreman: Lorenzo Rodriguez
LIME KILNS, rotary kilns, crushing & grinding and screening plant

PAXON G D & O W HARRIS
Box 1942, Parker
BILLY MACK MINE, Yuma Co, Au

PAXTON, J B
Wagoner
PAXTON MINE, 4 mi SE of Wagoner, vein, shaft, adit, Au, Ag, Pb, Cu, 10-TON MILL

PERRY, RAYMOND
Box 32, Vicksburg
SURPRISE MINE, Yuma Co, Pb, Zn, dev

PETERSON, KARL
Patagonia
MOWRY & HUACHACA GROUPS, near Patagonia, underground, Pb, Ag

PHELPS DODGE CORP
(See North Eastern listing)
ARIZONA OPERATIONS, Douglas
VP & Gen Mgr: H M Lavender
Asst Gen Mgr: C R Kuzell
Asst to VP & Gen Mgr: W C Lawson
Dir, Labor Rel: W J Urm
Office Mgr: H E Moore
Gen Audit: John Kuhn
Ch Engr: H V Kruse
MORENCI BRANCH, mines, concentrator & smelter at Morenci
Mgr: L M Barker
Gen Supt: W E Fenzi
NEW CORNELIA BRANCH, mines, concentrator & smelter at Ajo
Mgr: J B Pullen
Gen Supt: A J Barr

COPPER QUEEN BRANCH, Bisbee
Mgr: C E Mills
Gen Supt: W P Crawford
DOUGLAS REDUCTION WORKS, smelter
Mgr: C E Mills
Supt: M G Fowler
UNITED VERDE BRANCH, mines at Jerome, concentrator, Clarkdale
Mine Supt: H D Clark
PHELPS DODGE MERCANTILE CO, Bisbee, Douglas, Morenci, Clifton
Gen Mgr: Sidney Stickland, Douglas
NEW CORNELIA COOP MERCANTILE CO, Ajo

PHRONDEE CLAIM
Casa Grande
MINE in Pinal Co, Zn
Mgr: Tom Norris

PICACHO MINES, INC
Sells
Pres: R H Vanderbush, Los Angeles
COONCAN MINE, near Sells, Au
Prod: 250-tons monthly
Mgr: M W Readhead

PIEDMONT MINES, INC
Portal
Gen Mgr: L K Diffenderfer
HILLTOP MINE, underground, Pb, Zn
HILLTOP MILL

PILGRIM MINE
Crown King
Gen Mgr: J D McClintock
MINE, underground, Au, Ag, Cu
Supt: Don Von Tilborg
10-TON GRAV MILL

PIMA ROCK AND SAND
Ajo Way, Tucson
Pres: K D Lieberman
Engr: Louis Green
LOUDON MINE, 14 mi E of Sahuarita, adit, Cu

PINETOP MINE
Globe
MINE, Gila Co, Asbestos
Mgr: Grady Gulledge

PINTO CREEK MINE
Globe
MINE, Gila Co, W
Mgr: I D Budd

PLEDGE METALS, INC
Box 472, Superior
Mgr: R F Dannelly
AJAX GROUP, Pb, Zn

PRIDE OF THE WEST
Washington Camp, Cu, Pb, Zn
Mgr: R G Barclay

PUMICE CORP OF AMERICA
314 W Carey St N, Las Vegas, Nev
Mgr: B L Gamel
MINE & MILL, Pima Co, Mica

PYATT, J C
Box 587, Prescott
EMMA MINE, Yavapai Co, Pb

RACINE, L & BROCKWAY, A
Box 128, Globe
RAMBO & RESCUE MINES, Miami dist, Gila Co, Ag

RAINBOW MINE
Heber, open pit, Mn
Owner: J G Patrick

RAINEY, P J
834 W Thomas Rd, Phoenix
BULLDOZER MINE, Sahuarita, shaft, Cu

RAMSEY, JOHN L
Vicksburg
R & A MINE, Plomosa dist, Ag, Pb

RAMSEY MINES, INC
Bouse
Mgr: Jess Paris Box 563, Wickenburg
RAMSEY MINE, Yuma Co, underground
Pb, Au, Ag

REED, WM & ELMER BURTON
Klondyke
ABE REED MINE, underground, Pb

RENNER, JAMES
Box 142, Cave Creek
RED ROVER MINE, Maricopa Co, Ag, Cu
Prod: 5-tons monthly

REORGANIZED SILVER KING DIVIDE MINING CO, Prescott
MT UNION MINE, 10 mi S of Prescott underground, Au, Ag, Pb, Zn
Under dev

REYMERT EXT SILVER MINES
Box 521, Superior
Pres: Norman DeVaux
REYMERT MINE, Pinal Co, underground, Ag

REYNOLDS ALUMINUM CO
Phoenix
ALUMINUM EXTRUSION PL
Prod: 60,000,000 lbs yearly

REWARD MINE
Casa Grande
MINE, Pinal Co, Cu
Mgr: O T Manning

RIO DEL MONTE MINES, INC
Salome
Pres & Gen Mgr: O K Gilliam
VP: Emil Anderson
Sec Treas: E V Eckel
Dir: R G Conan
RIO DEL MONTE MINE, 4 mi SW of Salome, underground, Au, Ag, Cu, Pb
35-TON FLOT MILL, under dev

RITTER MINING CO
Patagonia
Mgr: Fred Ritter, Sr
KANSAS & MAINE MINES, Washington Camp, underground, Pb, Zn, Cu
Prod: 100-tons monthly

RIVERSIDE MINING CO
55 N Matlock St, Mesa
Pres & Gen Mgr: A H Johnson
RARE METALS & GRAY COPPER MINES, vein, shaft, square-set stoping, 8 mi S of Ray, Mo, Cu, Au, Ag

ROBERTS, J B
Box 1737, Parker
PROSPERITY MINE, 8 mi NE of Parker, vein, shaft, Au, Ag
SHURE SHOT MINE, Cu, Au, Ag, vein dev by shaft and open cuts

ROBINETT, DALTON
Box 501, Kingman
BULL CANYON MINE, 18 mi E of Yucca, open pit dev, W

ROCK CLIFF MINE
Florence
MINE, Pinal Co, Pb
Mgr: R J Edwards

ROLLER, D A
Kingman
ANDY CONA MINE, Cedar Valley dist, Cu, dev

ROSE BROS & GRAY
Walker Rt, Prescott
PINE MT MINE, Yavapai Co, Pb, Zn

ROSSI, V & R CHIARA
Bagdad
VICANO MINE, Yavapai Co, Pb, dev

RYDBOM BROTHERS
Elfrida
MINE, Cochise Co, Pb, Ag
Mgr: J F Rydbom

SAINT ANTHONY MINING AND DEVELOPMENT CO, LTD, Tiger
Pres: J A Fowler, Jr
VP & Gen Mgr: J A Richards
VP & Treas: Meyer Handleman
Asst Mgr: J J Strutzel, Jr
Ch Clk: B W Roebuck
MAMMOTH ST ANTHONY MINE, Au, Ag, Cu, Pb, Zn, Mo, V
Purch Agt: J A Gardener
Supt: Richard Eddy, Sr
Engr: B F McGuire
Foreman: J B Harry
250-TON FLOT MILL
Supt: E V Given
Foreman: P J Arnold
Assay: Manuel DeLeon
Smelter & Leaching Pl in standby cond

ST LOUIS MANGANESE CO
Box 527, Patagonia
Mgr: O Hogsett
Mn MINE & GRAV MILL

ST LOUIS MINE
Kingman
Owner: A T Loitzow
MINE near Chloride, Pb

SAN MANUEL COPPER CORP
Superior
Pres: A J McNabb
VP & Gen Mgr: W P Goss
SAN MANUEL MINE, Pinal Co, Cu
Engr: H I Ashby
Elec Engr: R P Diehl
Mech Engr: C A Bilson
Under dev

SANDERS, L. V.
Portal
LEADVILLE GROUP, Cochise Co, Pb

SANDERSON, HANS
Box 1614, Prescott
EVERGREEN MINE, Hassayampa mag dist, Pb, Zn, Au, adit & winze
(Leased from Roma Tomlinson)

SANTA TERESA MINING CO
Safford
Sec: Paul Merrill
MINE, Graham Co, Pb

SEIN FEIN MINING CO
Klondyke
Pres: Dean Nicholson
MINE, Aravaipa dist, vein, shaft, open stoping, Au, Ag, Cu, Pb
Supt: Raymond Pointer
Engr: E H Lundquist

SHAD, J L
Portal
GRACE MINE, Cochise Co, underground, Zn

SHANKLIN, W R
Box 7, Dos Cabezas
GOLD PRINCE GROUP, Cochise Co, underground, Au, Ag, Pb

SHAPLEY PROCESSING CO
(Division of Fluorspar Corp of America)
1488 E Town & Country lane, Phoenix
Pres: Cooper Shapley, Jr
VP: George Seeley
Sec Treas: C Lockwood
Met: M E Schaber
SNOWBALL & WHITE KING, 22 mi SW of Aguila, vein, shaft, Fluorspar
Prod: 25-tons

SHATTUCK DENN MINING CORP
(See North Eastern listing)
IRON KING MINE, Humboldt, Au, Ag, Pb, Zn
Mgr: H F Mills
Mill Supt: A L Pessin
KAY COPPER MINE, optioned from Black Canyon Copper Co, Inc

S W SHATTUCK CHEMICAL CO
1805 S Bannock St, Denver Colo
Pres: J Seward Potter
Mgr: George Scholey
NEW YEAR'S EVE MINE, Pima Co, open pit, Mo, Cu
Foreman: Tino Saunders
Mill Foreman: O Harril
Prod: 20-tons

SHOEMAKER, JOHN & CARL
Box 124, Prescott
GOLD COIN GROUP, Yavapai, Co, Au

SHORT, A B & V T
156 E Rogers Rd, Tucson
ARMISTICE GROUP, Hartford dist, Pb

SIERRITA MNG & RANCHNG CO
Ruby Star Rt, Box 25, Tucson
Treas: Lee Harris
GOLDEN FLEECE MINE, Pima Co, Au

SILVER FLAKE MINE
Prescott
MINE, 5 mi S of Prescott, shaft
Supt: J R Sanchez

SILVER QUEEN MINE
Superior
Operators: Arthur & Talmadge
MINE, Chloride Cliffs, Pb, dev

SILVER REEF MINE
Casa Grande
Pres & Gen Mgr: Sherwood B Owens
MINE, 13 mi S of Casa Grande, underground, open pit, Ag
Engr: E T Green
Supt: A W Gerhardt

SMITH, CHARLES H
Box 729, Superior
LITTLE FOUR TUNNEL MINE, Gila Co, Ag, Idle

SMUGGLER MINE
Patagonia, Zn
(Leased to Majalca & Grannillo)

SNOW DRIFT MINE
439 S Marina St, Prescott
Owners: H A & L Berberich
SNOW DRIFT MINE, 16 mi SE of Prescott, underground, Au, Ag, Cu, Pb, Zn

SOLPER & PIKE
c/o Lloyd W Solper, Bagdad
LITTLE JOKER MINE, Yavapai Co, Ag

SOMIND CONSOLIDATED MINES
Salome
Pres & Gen Mgr: N T Zuver
HARQUAHALA & EAGLE MINES, Ellsworth dist

SOUTHERN CROSS MNG CORP
Box 47, Quartzsite
Mgr: L A Aplington
LUCKY LEAD #1-8, 10 mi S of Bouse, underground, Pb, Zn, Ag, Au

SPARKES, GRACE M
Star Rt, Hereford
Mgr: Perry L Bones
STATE OF TEXAS MINE, Cochise Co, shaft, adit, Zn, Pb, Cu, Ag, Au

STEWART, CLYDER
Winterhaven, Calif
HARDSCRABBLE MINE, Yuma Co, dev

STODDARD MINE
Box 156, Mayer, Cu
Owner: Eugene Meyer

STRATEGIC METALS CORP
Box 849, Tucson
Pres: C C Calvin
VP & Treas: Irving Friedman
TUNGSTEN MILL, 1056 Mission Rd

SUCCESS MINING CO
c/o Hubbard Realty Co, Kingman
TELLURIDE CHIEF MINE, Wallapai Range, W
MILL at mine

SUMMIT COPPER MINES, INC
Box 116, Payson
Pres & Gen Mgr: R W Thompson
VP: Dr A L Gagnier
SUMMIT COPPER MINES, underground, Au, Cu
Foreman: W L Gist
50-TON GRAV MILL

SUNSET MINES, INC
Sells
Pres & Mgr: John Luizza
MINE, Pima Co, underground, Au

SUN-GOLD MINING CO
711 Valley Nat'l Bldg, Tucson
Treas: John C Gungil
SUN-GOLD MINE, Pima Co, underground, Au, dev
Mgr: Alfred E Turner

SUPERIOR & BOSTON MINES
Globe, Cu
Operator: E A Borge

SUTTON-DAYSDALE MNG CO
Box 35, Willcox
Pres & Gen Mgr: Wayne Sutton
SUTTON MINE, 16 mi SW of Bowie, shaft dev, Au, Cu, Pb

SWISSHELM GOLD-SILVER CO
338 N Granada St, Tucson
Pres: Ben Haney
SWISSHELM MINE, Cochise Co, dev

SYLER, P N
Portal
HARRIS MINES # 1-6, Calif dist, Pb, Zn, Cu

TENNESSEE METALS CORP
Box 1266, Kingman
Pres: R R Langley
Sec Treas: R H Lesher
Dir: Charles P Elmer
TENNESSEE, SUMMIT & ALPHA MINES, Chloride dist, underground dev, Pb, Zn
MILL, being reconditioned

THANKSGIVING MINE
Box 223, Florence
MINE, Mineral Hill dist, Au
Operator: Geo Myers

TOLEDO MINING CORP
622 Market St, Youngstown, Ohio
Pres: Port B Mellinger
VP: C L Thomas
Sec: C L Robinson
Dir: E W Bailey
MT SPRING MINE, Bagdad, vein, shaft, Zn, Pb, Ag, Cu, Au, Idle

TOMBSTONE DEV CO
Tucson
TOMBSTONE GROUP, Ag, Pb
Supt: Brooks Davis

TOMBSTONE EXTENSION
Tombstone, Pb
Mgr: R L Brown
Trustee; C M D'Autrenant

TORNADO MINING CO
Box 1086, Miami
Mgr: Wm Humphrey, Globe
LONDON ARIZONA MINE, Banner dist, Zn, Ag, Pb
TORNADO MINE, near Winkelman, Pb, Zn

TOUT MINES
Dos Cabezas
MINE, Cochise Co, Au, Ag, Cu
Mgr: Edwin I Tout

TUCSON MINING CO
Sahuarita
MINE, Pima Co, Pb, Ag
Mgr: Sam S Coldren

TUNGSTENITE MINE
Box 51, Kingman
Operator: Dalton Robinette

U V X MINE
Clarkdale
Operators: Peach & D'Arcy
MINE, Verde dist, Cu, Au, idle

UNION HILL MINE
Wickenburg
Mgr: Isaac Cambell
MINE, Maricopa Co, Feldspar

UNION PLASTER CO
Winkelman
Mgr: J S Tillman
MINE, Pinal Co, open pit, Gypsum

UNITED MINE OPERATORS
Box 836, Wickenburg
UNIDA MINE, Yavapai Co, Cu, dev
Supt: Ernest Sturrock
Engr: Lynn Hershey

UNITED MINERALS RESERVE
(See Utah, Nev, and Idaho listings)
SANTA CRUZ MINE, Harshaw mining dist, dev, Cu

UNITED MINES COMPANY
Chloride
Pres: M B Maxwell
VP: Dr J O Irish
Sec Treas: C L Lind
EVAHOM, LITTLE TENN, & SCOTCH LASSIE GROUPS, dev, Au, Ag, Zn

U S BUREAU OF MINES
Box 4097, University Station, Tucson
Mgr: Charles A Kumke
MAGGIE GROUP, Alamo, underground, Mn

U S SMELTING, REFINING & MINING CO, (See Northeastern listing)
GOLD MINE, idle

UNIVERSAL MINERALS RECOV
Wickenburg
Operators: Goody & Wiksten
500-TON CONCENTRATOR, tailings of Vulture Mill, Pb, Au

UPSHOT MINES, INC
Box 591, Prescott
Pres: Omar D Smith
VP: D H Wachtel
Sec Treas: C E Ekroth
UPSHOT MINE, Yavapai Co, underground dev, Ag, Cu, Pb

URANIUM, INC
Box 2568, Tucson
Agt: W S Dunipace
PAPAGO CHIEF MINE, 72 mi SW of Tucson, idle, Cu

VANADIUM CORP OF AMERICA
(See Northeastern and Colo listings)
Tree Nos Pas
MONUMENT #2 MINE, Monument Valley dist, underground, U, V
Supt: Walter Watt, Durango, Colo
Mine Supt: Booth Eckman
Prod: 1600-tons monthly

VANADIUM INVESTMENT CO
Box 1005, Globe
Mgr: R Scott
MINE in Gila Co, underground, Pb, Ag
91 Group in Pinal Co

VAN HOOK MINING CO
Box 53, Prescott
DAVIS-DUNKIRK MINE, Yavapai Co, Au, Ag
Supt: A C Van Hook

VERDUGO, T H
Box 1923, Clifton
CLIMAX LODE MINE, Copper Mt dist, Au, Ag

VOGEL, NEIL C
Tombstone
MINE, Cochise Co, Ag, Pb

VULCAN MINE
Tucson, Cu
Operator: W W Adams

WALKER & EDWARDS
c/o Dudley Walker, Ray Junction
LEAD MINE

WARD, JOE
Box 1041, Prescott
GREAT SCOT MINE, 19 mi SE of Prescott, vein dev by shaft, Zn, Pb, Ag, Au

WILLIAMSON & GULLEDGE
Pima
LEAD KING MINE, Zn, Pb

WINN, LOUIS
Globe
MONEY METALS MINE, Gila Co, underground, Au, Ag, Pb, Zn

WOLFF, CARL
Box 100, Lowell
ORCHARD & ANNEX CLAIMS, Cochise Co, under dev

YUCCA MINING & MILLING CO
Box 67, Yucca
Pres & Gen Mgr: R J Dalton
Dir: B F Williams
ANTLER MINE, underground, Cu, Pb, Zn, Au, Ag
Supt: R O Giroux
120-TON FLOT MILL
Supt: J R Payne

ZANNARAPOLIS TUNGSTEN
Box 500, Congress
Owner: J P Zannarapolis
Supt: J P Robinson, Jr
50-TON GRAV MILL, dev

CALIFORNIA

A H L MINING CO
Box 240, Newcastle
Mgr: E W Ammon
MARY LEN LODE, Auburn dist

ABBOTT MINES, INC
703 Market St, Rm 1804, San Francisco
Pres: R F O'Brion
Gen Mgr: C O Reed
ABBOTT MINE, Williams, udgrnd, Hg
FURNACE OPERATION

ADAMS, C C
Box 97, Kelso
REX MINE, Kelso dist, lode

ADAY, OTIS
Folsom
JOERGER PLACER, West Belt dist

ADOBE MINING CO
Rt 4, Box 349, Madera
Mgr: Harold E Larsen
ADOBE RANCH MINE, Dennis dist, Au
MENDOZA & WATSON PLACERS

AKIN, M H
La Porte
DAVIS MINE, Sierra Co, Au placer

ALASKA MINE
685 6th St, San Francisco
MINE, Pike, Au
Mgr: R J Kohlen
40-STAMP MILL, Pike
(Leased by H L Sorenson)

ALCAN MINING CO
5261 Stockton Blvd, Sacramento
COFFEE CREEK DREDGE, placer, Trinity River dist

ALHAMBRA GOLD MINE CORP
Georgetown
Pres & Gen Mgr: O H Griggs
VP: S W Binker
Sec Treas: H A Plainer
Geol: E L Reeves
ALHAMBRA MINE, El Dorado Co, 11 mi NE of Placerville, underground, Au
Supt: Fred J Pearney
50-TON FLOT MILL, dev
SUNSHINE MINE, Plumas Co, 8 mi S of Quincy, idle

ALICE MINE
Isabella, Sb
Operator: R L Coughran

ALLEN, J
Chinese Camp
WOOD CREEK MINE, Tuolumne Co, placer, Au

ALLOY MINING CO
2320 N Alameda St, Compton
Pres: B A Barre
Gen Mgr: W H Hile
Dir: A D Disney
Purch Agt: C C Randall
NEW TRAIL MINE, Hipton, underground, Au, Ag, Cu
Foreman: C P Hale
Prod: 200-tons monthly

ALMADEN DUMPS
Almaden
MINE, Santa Clara Co, Hg

ALTANA CORP
Nipton
MINE, Mohawk, Au, Ag, Cu, Pb

AMERICAN MINERALS CO
800 S Mission Rd, Los Angeles
Commercial grinding of minerals

AMERICAN POTASH & CHEM CO
3030 W 6th St, Los Angeles 54
Pres: Peter Colefax
VP of sales: W J Murphy
VP, tech oper: R W Mumford
VP, non-tech oper: R B Coons
Western sales Mgr: D B Scott
Pl Mgr: A J Anderson
Purch Agt: L H Cornelius
MINE, Trona, Sylvite, Br, Li
Prod: 550,000-tons yearly

AMERICAN SMELTING & REFINING CO, (See Northeastern listing)
405 Montgomery St, Sn Francisco
SELBY SMELTER, Selby, lead smelter & refinery
Mgr: W S Reid
Purch Agt: J M Hanna
Gen Supt: H P Wagner
Smelter Supt: R E Shinkoskey
Refinery Supt: B K Shedd
Mast Mech: W H Holmes

ANACONDA COPPER MNG CO
(See Northeastern listing)
WESTERN OPERATIONS
VP: E S McGlone
Gen Mgr: F A Wardlaw, Jr
DARWIN MINES, Darwin, Pb, Zn, Ag
Mgr: S K Droubay
Purch Agt: J H Collins
Supt: F E Tong
Foreman: M M Tilley
Engr & Geol: D L Davis
Ch Elec: F Paetsch
Mast Mech: R M Trezona
DARWIN FLOT MILL, Darwin
Supt: E C Peterson
Assay: Louis Warnken
Met: H M Lindholm
Prod: 435-tons
SHOSHONE MINES, Tecopa, Pb, Ag, Au, Zn, vein, shaft, adit, open stoping
Supt: F A Baby
Foreman: H I Hill
Engr & Geol: E M Adrian, Jr
Power Pl Foreman: H Deasey
140-TON MILL, Tecopa
Foreman: J H Teel

ANCHO ERIE MINING CO
401 2nd St, San Francisco
Gen Mgr: Bert C Austin
MINE, Underground, Au
Supt: S J Odgers
200-TON CYANIDE FLOT MILL
Supt: Ira D Billick

ANDERSON ROCK PLANT
Box 1372, Fresno
MINE, Fresno Co, Placer Au

ANKENEY, GEORGE D
642 N St, Yureka
LONG GULCH CLAIM, Siskiyou Co, underground, Au

ANTELOPE MINING CORP
Star Rt 1, Box 49-A, Lancaster
ROGERS-GENTRY MINE, Au

ARCHER MINING CO
510 S Spring St, Los Angeles 13
Pres: B C Aoos
VP: F B Belcher
Gen Mgr & Purch Agt: R D Prior
ARCHER MINE, Coalinga, Hg
Supt: Gene Hermansen
Engr: V Areinriga

ARGENTENA CONS MNG CO
257 S Spring St, Los Angeles 12
Pres: H L Martin
Sec: C W Adams
(See Nev listing)

ARGO, ROY
11837 S Loma Drive, Whittier
TIN MINE

ASSOCIATED METALS, INC
c/o Hayes Evans, Rt 2, Sequim Wash
Pres: Ira Nahon
PINE GROVE MINE, 10 mi E of Jackson, underground, Au
ORO GOLD MINE near Downieville, Box 194, Pioneer
Supt: J T Bonner

ATKINS KROLL & CO
320 California St, San Francisco
SMELTING & REDUCTION, Hg, Gypsum

ATOLIA MINING CO
1022 Crocker Bldg, San Francisco
Pres: P R Bradleu Jr
UNION MINE & others, Atolia, W Au
(Leased to Hoefling Bros)

BACHELS, ANDREW & PAUL
80 Pierce St, San Francisco 17
EMPIRE-LONE STAR GROUP, 12 mi NE of Downieville, vein, shaft, adit, Au, idle
MEXICAN MINE, 2 mi E of Goodyear's Bar, vein, adit, Au, idle

BAINBRIDGE & McHENRY
Nipton
CARBONATE HILL MINE, Kingston dist, Au, Pb, Zn

BAKER, TOM
Box 21, Shoshone
TERESA TURQUOISE MINE, Inyo Co, underground, Ag, Cu

BALLANCE, JOHN W
Nipton
BLUE BUZZARD MINE, Clark Mt dist, Ag, Cu, Pb

BARIUM PRODUCTS, LTD
(See North Eastern listing)
SAVERPOOL MINE, Plumas Co, Barite
ALMANOR MINE, Greenville, Barite
Mgr: J B Perry
Supt: H J Tillia
Engr: R F Love
Mill Fore: T J Cayot

"BARNETT"
c/o Thos E Creed, Cima
MINE, San Bernardino Co, Au, Ag, Cu, Pb

BARNETT & GREEN
Gen Del, Ripon
CHEROKEE MINE, Mariposa Co, Au idle

BARRETT, W J & MARY
4476 Santa Cruz Ave, San Diego 7
TRAILS END MINE, SQUARE NAIL CLAIM, Calica dist, Au, Ag, Cu

BASIN MINING CO
Box 726, Bakersfield
Mgr: Dan Cronin
JOE WALKER LODE, Piute dist

BASSLEY, FREDERICK
Box 443, Yureka
CHERRY HILL MINE, Scott R dist

BAUMEISTER & SON
Box 396, Cloverdale
MINE, Cloverdale, Hg

BEAN, STONE & ASSOC
Woodleaf
SLAPJACK MINE, underground, Au

BEAR VALLEY MINING CO
Bear Valley
NELLIE KAHOO MINE, lode, dump, Mother Lode dist

BECK, MARTIN
Box 343, Mohave
ELEPHANT EAGLE & WHITEMORE MINES, Kern Co, Au, Ag, Pb
CUSTOM MILL

BEDWELL, VIRGIL
Box 26, Denair
PRETZ MINE, Mariposa Co, underground, Au

BELDEN AMADOR MINES, INC
Box 39, Pine Grove
VP & Gen Mgr: Leon M Banks
BELDEN MINE, underground, Au
GRAV FLOT MILL

BENNETT & BARGINSKI
Box 4, Trona
INDEPENDENT MINE, lode, Wild Rose dist

BENNETT MINING CO
Weaverville
MINE, Trinity Co, placer, Au

BENNETT, PERRY T
Box 324, Weaverville
REX MINE, Trinity R dist, hydraulic placer

BENNETT, V B
211 N 16th St, Sacramento
PLACER, Trinity Co, dredge, Au

BERG & SCIOCHETTI
Box 637, Hollister
JUNIPER MINE, 51 mi SE of Hollister, vein, adit with open stoping, Hg
Prod: 14-tons

BERTIE, DR WILLIAM J
Box 843, Las Vegas, Nev
COARSE GOLD, COARSE GOLD #2, & DOUBLE CROSS CLAIMS, Plumas Co, placers, Au

BEST MINES CO
Box 177, Downieville
Owner: C L Best
GOLD BLUFF, BUSH CR & OXFORD MINES, underground, Au
Mgr: L L Huelsdonk
Foreman: W T Reed, Jr
Engr: B C Austin
Elec: A R Hinton
100-TON FLOT GRAV MILL
Supt: John Folsom
Foreman: Vernon Huffman

BETHLEHEM PACIFIC COAST STEEL CORP, 20th & Illinois Sts, San Francisco
SMELTING & REDUCTION, Iron ore

BEYER, JACK
Rosamond
GOLDEN QUEEN MINE, Mohave Co, lode

BIG GOLD MINE
Box 251, Randsburg, Au, W
Operator: J M Kreta

BILLS, L C
3814 Chestnut Ave, Long Beach
JIM TOM CLAIM, Randsburg dist, Au

BISHOP CONC & CLEANING CO
Bishop
CUSTOM MILL, W & base metal ores

BLACK EAGLE MINE
c/o Eagle Lead Co, Indio
Mgr: W E Covey
MINE, Ag, Pb, Au, Cu

BLACK ROCK MINING CORP
Box 702, Bishop
Pres: R L Wright
MINE, Inyo Co, 35 mi N of Laws
Mgr: A E Beauregard
25-TON GRAV MILL

BLACKSTONE MINE
5208 Barrett Ave, Richmond
Gen Mgr: L A Sanchez
BLACKSTONE MINE, 4 mi N of West Point, underground, Au, Ag, Pb, 30-tons
Supt: Elliot H Syms
Foreman: Louis Sanchez
30-TON FLOT MILL
Foreman: Tony Partal
SMELTER, Au, Ag

BLAKEMORE, PAGE B
Bridgeport
PITTSBURGH MINE, Mono Co, underground, Au, Ag

BLANCHARD, WILLIAM E
North San Juan
JUNCTION MINE, Nev Co, placer, Au

BOUVIER, A R
Callahan
PANARO MINE, Siskiyou Co, placer, Au

BOYLES, G M
Portola
WALKER MINE, Plumas Co, udgnd, Cu

BRADFORD, L M
Box 207, Madera
DAULTON MINE, Daulton dist, Ag, Cu, Pb

BRADLEY & EKSTROM
320 Market, San Francisco
SMELTING & REDUCTION, Mn

BRADLEY MINING CO
425 Crocker Bldg, San Francisco 4
Pres: Worthen Bradley
Sec Treas: E A Briffen
REED MINE, Monticello, Hg
SULPHUR BANK MINE, Clearlake, Hg
GREAT WESTERN MINE, Middletown, Hg

BREUER, WILLIAM
1149 Oak Grove, Los Angeles 41
D & B MINE, Armagosa dist, lode

BRIGGS, HARRY E
Box 613, Trona
RED CLOUD MINE, Inyo Co, Au, Ag, Pb

BRIGHT, DICK
Bishop
REWARD MINE, Inyo Co, Au, Ag, Pb

BROCK, ROBERT
River Rt, Box 23, Madera
HEISKELL PROPERTY, Madera Co, Au

BROOKS, J C
Box 26, North San Juan
BIG CHIEF & AMERICAN DIGGINGS, Nevada Co, placers, Au

BROWER, JESSE H
Bagby
COMBINATION MINE, Mariposa Co, underground, Au

BROWN BEAR MINES
French Gulch
Gen Mgr: E E Erich
MINE, underground, Au
70-TON FLOT MILL, dev

BROWN, LESTER
Box 674, Bishop
L & L MINE, Inyo Co, W

BROWN'S CREEK PLACER
Box 23, Weaverville
GOLD PLACER, Trinity Co

BRUN, HAROLD
Strawberry Valley
GEORGIA GULCH MINE, Yuba Co, placer, Au

BRYAN, BERT L
Smith Flat
IDA BRYAN PROP, El Dorado Co, Au

BUCKMAN, INC
The Geysers
DEWEY MINE, 1 mi NW of The Geysers, adit & open cuts, Hg
CONTACT MINE, 4 mi SE of Dewey Mine Hg
50-TON ROTARY FURNACE

BUENA VISTA NO 2 MINE
Box 25, Redding
Owner: H G Graves
MINE, 3 mi W of Redding, Au, Cu, idle
20-TON FLOT MILL

BUNKER HILL MINING CO
Box 1347, Redding
Gen Mgr: A Mansfield
BUNKER HILL MINE, 3 mi NW of Redding, underground & open pit, Au, Ag, Cu, dev
Foreman: Peter Kanuck

BUNKER, ROY
Sonora
GLOSTER LODE, East Belt dist

BURKHART, B F
Bear Valley
A J CLAIM, Mariposa Co, undgrnd, Au

BURTON MINES, INC
Rosamond
Mgr: C G Burton
Asst Mgr: G A Settle
Purch Agt: George McNamee
TROPICO MINE, 5 mi W of Rosamond, underground, Au, Ag
Kid Shaft, leased to Burton & Wall
Fairview Shaft, leased to Lee & Watts
Tropico Shaft, leased to Lee, Ogle & Sims; Pengilley & Wall, Art & E Watts
RUTH MINE, 13 mi NW of Trona, underground, Au, Ag, idle
100-TON CYANIDE MILL
Foreman: Alec Burton

BUTTE LODE MINING CO
Box 195, Randsburg
BUTTE LODE MINE, Kern Co, underground, Au, Ag
CUSTOM MILL

BUTZ, ALBERT
Box 1103, Nevada City
SUNSHINE LODE, Grass Valley

C H M LEASING CO
Iowa Hill
OCCIDENTAL MINE, Placer Co, Au

CALVERAS CENTRAL GOLD MINING CO, LTD, Angels Camp
Pres & Gen Mgr: Harry Sears
Mgr: Desmond Sears
MINE, shaft and drift, Au
CRUSHING & SCRUBBING PL, Au
Prod: 600 to 800-tons
Under dev

CALIFORNIA LIBERTY MINE CO, INC, Dobbins
Pres: F J Wilson
MINE, N of Dobbins, underground, Au
Supt: Vern Cox

CALIFORNIA SILVER CORP
9814 Washington Blvd, Culver City
ANNEX MINE, Silurian dist, Ag, CuPb

CALIFORNIA ZONOLITE CO
Sacramento
Mgr: C H Wendel

CALIVADA DEV CO
Box 4, Garden Valley
Gen Mgr: H T Hall
EL DORADO MINE, West Belt dist, lode, Cu

CALRADO DEV CO
406 Kress Bldg, Long Beach 12
Gen Mgr: L F Albrecht
WEST COAST LIMESTONE PROD CO & BLACK CAP MANGANESE CO MINES, 22 mi NW of Blythe, adit & open pit, Mn, Limes
Supt: R S Hall
Met: Dr Kennard

CAMPION, IVAN H
Somerset via Coles Station
IRISH SLIDE MINE, 23 mi SE of Placerville, underground, placer, Au, Ag

CAPITOL DREDGING CO
351 California St, San Francisco 4
Pres: S M Bolster
VP & Gen Mgr: F C Van Deinse
PLACER, Rt 2, Fair Oaks, bucket dredge, Au
Gen Field Mgr: C V Deaver
Dredgemaster: M B Chaffin
Shop Foreman: W H Bolin

CAPURRO, MIKE
Iowa Hill
STRAWBERRY PLACER, Iowa Hill idle

CARBONATE KING MINES
481 Church St, San Bernardino
Mgr: O B DeWitt
LODE MINE, Clark Mt dist

CARNOW, JAMES
Coulterville
LUCKY MINE, Mariposa Co, Placer, Au

CARSON HILL GOLD MNG CORP
206 Sansome St, San Francisco
VP: W A Rabbett
Sec Treas: D D Farley
MINE, Melones
1,000-TON CONCENTRATOR with cyanide plant

CASA DIABLO MINE
Bishop
Mgr: J W Bertram
MINE, Mono Co, Au, Ag, Pb

CASSELBERRY, FRANK
Box 543, Grass Valley
MOORE'S FLAT MINE, Nevada Co, placer (tailings), Au

CASTEEL, L R
Rt 1, Box 878, Fresno
HUDSON PROF MINE, Madera Co, placer, Au

CASTRO CHROME ASSOC
232 Montgomery St, San Francisco
Operator: G I Barnett
MINE, near San Luis Obispo Creek
GRAV MILL, at mine

CENTRAL EUREKA MINING CO
Russ Bldg, San Francisco
Pres & Gen Mgr: J D Swift
VP: Keith Kunze
Purch Agt: E Cunningham
Sec Treas: D D Smith
Gen Supt: A Kendall
MINE at Sutter Cr, Amador Co, underground, Au, Ag
Foreman: E Mortensen
Shiftboss: Sam Hargis
Mech Engr: Primo Frediani
Elec Engr: Paul Ransom
Safety Engr: Nick Eliskovitch
250-TON STAMP FLOT MILL with cyanide unit, Au, Ag
Supt: Keith Kunze
Foreman: Don Jones
Assay: Frank Arnisi

CENTRAL PACIFIC GOLD MNG
6218 Sycamore St, Seattle, Wash
Pres: W H Patterson
Sec & Mgr: Mrs Laura Munk
SURE PAY MINE, 18 mi E of Oroville, Au, Ag, Pb

CHAMBERLIN, CHARLES
Box 24, Johannesburg
O K GROUP, Kern Co, undgrnd, Au

CHAPMAN & SONS
Junction City
CHAPMAN & FISHER PLACERS, Trinity Co, hydraulic, Au
Supt: G P Champan

CHASE, ED
Box 202, Downieville
CHASE MINE, Sierra Co, Au

CHENOWETH, E E
6517 Raymond St, Oakland 9
ORO GRANDE PLACERS, Siskiyou Co, Au

CHLORIDE CLIFFS MINE
Beatty, Nev
MINE, Inyo Co, underground, Au, Pb

CHOWCHILLA DREDGE CO
Box 348, Whittier
CHOWCHILLA MINE, Madera Co, placer, dredge, Au

CHRISTENSEN, LOUIS
Downieville
RELIANCE LODE, Sierra City dist

CHRISTMAS GIFT
247 N Virginia St, Reno, Nev
Mgr: W V & L V Skinner
MINE, Darwin dist, Inyo Co, Ag, Pb

CITY BLUE GRAVEL MINE
Box 206, Redding
Officers: H G Hampton, R H Cochran, Donald Flaylinsen
MINE, 1 mi W of Redding, undgrnd, Au
25-TON FLOT MILL

CLAIR, DON H
Box 5, Trona
MARGARET MINE, Inyo Co, undgrnd, Au

CLAREMONT MINING CO
Ivanpah
SAGEMORE MINE, New York Mt dist, Au

CLARK, J EARL
Comptonville
WILLOW CR MINE, Comptonville dist, placer

CLAYE, ROBERT JR
427 Lane St, Yreka
GOLDEN RULE MINE, Siskiyou Co, underground, Au

CLOUD, J R JR
McKeon
BLUE EYES MINE, Placer Co, Au

CLOVERDALE MINE
Cloverdale
Gen Mgr: Andrew Rocca
Supt: Joseph Garcia
Partner: Joseph Schor
MINE, near Cloverdale, Hg
70-TON ROTARY FURNACE

COCHRAN, R H
Box 206, Redding
BLUE GRAVEL LODE, Redding dist

COEUR, NEL
Box 199, Sonora
LUCKY STICK MINE, Tuolumne dist, underground, Au

COFFER, BERT
2902 E St, Sacramento
OLD GOLD MINE, Serra Co, placer, Au

COLE, DARRELL V
Box 157, Randsburg
COLE GROUP, placers

COLE, STUBB
Youngs P O
IRISH SLIDE MINE, El Dorado Co, placer, Au

COLLINS, JOHN T
Julian
ELLA GROUP MINE, San Diego Co, underground, Au, Ag

COLORADO GROUP
Cosos dist, Inyo Co, Pb
Operators: Wright & Taylor

COLUMBIA MINING CORP
Klamath River
COLUMBIA LODE, Klamath River

CONN, A J
Amboy, Ag, Pb
WAR EAGLE MINE, San Bernadino Co

CONS ROCK PRODUCTS CO
2730 S Alameda St, Los Angeles 54
Pres: Robert Mitchell
VP: Q W Best
Sec: S F Whaley
Prod Mgr: R C Griffin
Purch Agt: L L Haney
Safety Engr: R E Montgomery
LARGO PLANT, Azusa, open pit, Au
Supt: G A Lagrone

CONSOLIDATED TUNGSTEN
1739 Terrace Ave, Fresno
Owner: A R McGuire
MINE 23 mi E of Dinuba, W
Foreman: C L Tibbals
50-TON GRAV PLANT
Supt: Ellis Sterling

COOLEY, ROBERT D
Rt 2, Yreka
ROBERT D MINE, Siskiyou Co, Au

COPPER BASIN MINE
Parker, Ariz
Operators: Dilts & Hile
MINE, San Bernardino Co, Cu

COPPER HILL MINE
520 Geary St, San Francisco
Trustee: R E Fitzgerald
COPPER HILL LODE, West Belt dist

CORDERO MINING CO
57 Post St, San Francisco
CORDERO MINE, 18 mi E of Hollister, underground, Sb
NEW ALMADEN MINE, Santa Clara Co, dev, Hg

CORDILL, ROBERT H
Nipton
H & H SILVER MINE, San Bernardino Co, Ag, Cu

CORONADO COPPER & ZINC CO
Bella Vista
Pres: R W Moore
VP: H T Mudd
Gen Supt: K C Richmond
Purch Agt: A I Davidson
AFTERTHOUGHT MINE, 22 mi NE of Redding, unddgrnd, Zn, Cu, Pb, Ag, Au
80-TON FLOT MILL
Supt: R K McCallum

COSUMNES GOLD DREDGING CO
465 California St, San Francisco 4
Pres: G M Standifer
Gen Mgr: A W Hopfield
PLACER, Slough House, bucket dredge

COSUMNES MINES, INC
Grizzly Flats
MINE, El Dorado Co, Au, Ag

COURSON, W W
Box 202, Randsburg
NANCY HANKS MINE, Kern Co, underground, Au, Ag

CRABTREE & SULLIVAN
Jackson, Amador Co, Mn

CRESCENT PACIFIC MNG CO
807 Newhall Bldg, San Francisco
Pres: E L Oliver
Gen Mgr: B L Eastman
Sec: J N Dicks
Dir: John Daniel
MIDDLE YUBA MINE, Nevada City, dragline, Au
Supt: L A Smith
PROD: 100-200 ounces

CREVISTON, HAZEL
Comptonville
MARY JANE GROUP, Sierra Co, Au

CROOKS, ROBERT S
Happy Camp
LUCKY BOY MINE, Siskiyou Co, Au

CROW, M V
Box 690, Nevada City
LOCKE MINE, Sierra Co, placer, Au

CRUMPTON, VICTOR
Happy Camp
MINE, Siskiyou Co, Au, Ag

CRYSTAL MINE
Box 93, Healdsburg
MINE 19 mi NE of Healdsburg, Hg
Mgr: C A Baumeister
CULVER-BAER MINE, 16 mi SW of Cloverdale, Ag
adits and surface cuts
30-ton Rotary Furnace
Prod: 10 flasks/month

M L CUMMINGS
3041 Montgomery Way, Sacramento
FRIENDLY GROUP, Sawpit district, placer

FRANK CZERWONKA
P O Box 104, Lucerne Valley
RAMBLER, Blackhawk district, lode

DAILEY, HERMIS W
Burnt Ranch, Trinity Co
LAST CHANCE MINE, placer, Au
SURPRISE COPPER MINE, underground, Cu

DANCER, C
Box 104, Grass Valley
FAY MINING CLAIM, Nevada Co, placer, Au

DARRINGTON, L
Folsom
JOHN AVERY PROPERTY, Placer Co, Au

DARWIN ANTIMONY NO 1
514 1/2 N Main St, Santa Ana, 56
Operator: James B Utt

DAVIDSON, BERT
Nevada City
SADIE D MINE, Nevada Co, underground Au

DAVIES, TOM
Caliente
JUAN DOSE MINE, Kern Co, underground, Au, Ag
MINNIE ELLEN MINE, Tulare Co

DAY, ROBERT
Mokelumne Hill
PRINDLE RANCH MINE, Calaveras Co, Placer, Au

DEER TRAIL MINING CO
Box 191, Yreka
Gen Mgr: Don Adler, Seattle, Wash.
DEER TRAIL MINE at Yreka, Au, Ag, Pb
Cons Eng: Carl W. Yates

DEFENSE MINE
c/o Foreman & Skinner, SaltLake City, Utah
MINE in Modoc dist, Inyo Co
Au, Ag, Cu, Pb

DEL NORTE MINING CO
Mojave
DEL NORTE MINE, Wildrose district, lode

DENNIS, HARRY
Mojave
WHITMORE MINE, Mojave District, lode

DERRUAU, RENE M
Forest, via Alleghany
BIXBY (claim), Alleghany district, lode

DESERT MINE
H Trehearne, Nipton
A H Smith, 366 Parke St, Pasadena

DESERT TALC & CLAY CO
Pomona
TALC MINE at Yucca Grove, San Bernardino Co

DEWAR, BENNETT & GUYTON
Eldorado
INDEPENDENCE MINE, Mother Lode district, El Dorado Co, Au, Ag

DEWITT, O B
Nipton
CARBONATE KING MINE, San Bernadino Co, underground, Ag, Pb

DIAZ, R
Idria
AURORA MINE, Hg

DICALITE DIV, GREAT LAKES CARBON CORP
612 S Flower St, Los Angeles 17
Pres: George Skakel
Operations Mgr: E A Harris
Gen Mgr: George Skakel, Jr
Purch Agt: T D Moir
OPEN PIT, Diatomaceous earth
Engr: D F Dyramid

DILTZ ORO GRANDE MNG CO
414 21st St, Merced
Operator: J J Fulham
MINE, Mariposa Co, Au

DOHERTY & MORRICE
Forest Hill
MARIGOLD QUARTZ MINE, Placer Co, underground, Au

DONNER, H L
Milton via Parmington
DONNER & LOST LOG MINES, Calaveras Co, Au

DORCH, WILLIAM
Sawyers Bar
RAINBOW GROUP, Siskiyou Co, placer, Au

DOWDEL & FARISS
Hayfork
HOME EXTENSION MINE, Trinity Co, placer, Au

DRUMMOND MINING CO
444 40th Ave, San Francisco 21
Pres: Frank Lintini
Gen Mgr: W A E Meyer
DRUMMOND MINE, Box 232, Forest-hill, Au, Ag
Foreman: Michael Tanda
50-TON FLOT MILL, dev

DUBOIS MINES
West Point
Operator: E H Dubois
LOUISE MARGARET CLAIM, E Belt dist, underground, Au

DUCOTEY, G F
Box 8, Cedar Ridge
OMEGA PLACER, Washington dist

DYSERT, N S
Sawyers Bar
EMMA & RAY PLACERS, 9 mi from Sawyers Bar, dev, Au

EAGLEBIRD MINE
804 E St, Marysville
Gen Mgr: C H Johnson
MINE, 10 mi SE of Downieville, vein dev by adit, cut-fill stoping, Au, Ag
15-TON STAMP MILL

EAGLE MINING CO
Rt 1, Bishop
Gen Mgr: Frank Nelson
EAGLE MINE #1 & 2, 35 mi E of Bishop, Ag, Au, Pb
SMALL MILL at mine

EDGECUMBE EXPLOR CO
281 S Hudson, Pasadena 5
Pres: Mrs Charlotte Morgan
VP: C A Haley
Sec: Arnold Holden
Treas & Gen Mgr: G H Morgan
(See Alaska listing)

EDWARDS, WILLIAM G
1560 Clarke St, San Leandro
FOUR HILLS MINE, Sierra Co, underground, Au

EKEL, ALVAH G
Ione
LANCHA PLANA MINE, Amador Co, placer (tailings) Au
HILL TOP MINE, Calaveras Co, Au

EL DIABLO MINING CO
Box 567, Bishop
Pres: W A Trout
Gen Mgr: H O Hahanson
MINE near Bishop, W
Supt: C H Olds
50-TON CONC, magnetic separation

EL DORADO ARGONAUT MINE
Georgetown
Mgr: Victor J Pedri
MINE, El Dorado Co, underground, Au

EL ENCINO CO
San Andreas
EL ENCINO BLUE GRAVEL MINE, Calaveras Co, placer, Au

EL PESO DE ORA, LTD
Box A, Camarillo
Owner: Mrs Ester B McDonald
EL PESO DE ORA MINE, SE of Banner, shaft, adit dev, Au, Ag
Supt: G L Herrington, Sr

ELLIOT, P W
8451 Slater Ave, Rt 1, Huntington Beach
CRAYCROFT PLACER, Downieville dist

ELLIS, L G
Star Rt, Oro Grande
PAY CHECKER CLAIM, San Bernardino Co, underground, Au, Ag

EMMA NO 1 & 2
Box 640, Palo Alto
(See Fisher Research Laboratories)

EMPIRE STAR MINES CO, LTD
(See North Eastern listing)
Box 1027, Grass Valley
EMPIRE STAR & DONNEBRODGE MINES, vein, shafts, cut-fill and open stoping, Au
Asst Mgr: B Dellinger
Foremen: Albert Hampton, Thomas Thompson, William Wales
Engr: Morton White
Mech Engr: Phil Keast
Elec Engr: Leo Mann
2 500-TON FLOT CYANIDE MILLS
Supt: Chester Edwards
Asst Supt: Arthur Dowdell
Foreman: Frank Lopes
Assay: Wm Feil
Met: James T Curry

ENNIS, C
North San Juan
COME & GET IT CLAIM, Nevada Co, underground, Au

ERICKSON, JOHN
Quincy
PILOT PEAK MINE, Plumas Co, placer, Au

ESCOBAR, MRS MABLE
Coulterville
BIG CHICK MINE, Mariposa Co, placer, Au

ESTEY, CLYDE E
Box 453, Camptonville
SOLIDARIY GROUP & PINE FLAT #3 MINES, Yuba Co, placers, Au

EUREKA LEAD & ZINC MINE
Rt 1, Box 89, Glendora
Owners: F D & H H Shuck
Ag, Cu, Pb, Zn

FAIR OAKS GRAVEL CO
Rt 1, Box 553, Fair Oaks
GRAVEL PLANT, Sacramento Co, Au

FAIRVIEW CHROME MINE
640 Lane St, Yreka
Owner: H E Ellickson
FAIRVIEW MINE, Hamburg

FAIRVIEW PLACERS
Lewiston
(Joint venture of Sunshine Mng Co, The Lehman Corp & The Idaho Canadian Dredging Co)
Owners Rep & Gen Mgr: H B Murphy
Purch Agt: A D Solue
PLACER, 10 mi N of Lewiston, 8,000-yd bucket dredge, Au, Ag
Supt: H C Young

FEASLER, ARTHUR G
397 Bartlett Ave, Sunnyvale
EL DORADO MINE, Sierra Co, Placer

FERNANDEZ, FRANK C
1326 Pine St, Santa Monica
Gen Mgr: George Greve
MONO PIUTE RAINBOW MINE, 16 mi NE of Bishop, vein, adit, openstoping, Au, Ag, Pt
GRAV MILL, Piute Canyon, 25-tons

FIDELITY MINE
Columbia
Mgr: Wayne Stobough
MINE, Au, Ag
Supt: Vernon Ray
3-TON GRAV MILL

FIFE, E J
Star Rt, Box 728, Lucerne Valley
BUCKHORN LODE, Holcomb dist
HIGH POINT LODE, Bellville dist

FIGUEROA, DAN & SONS
Rt 1, Box 8, Blythe
BALD EAGLE LODE, Ironwood dist

FINLEY & VIGNICH
Panamint Springs via Lone Pine
MINNIETTA MINE, undergrnd, Au, Ag, Pb
Engr: Dave Baker
GRAV MILL
Mgr: Clayton Dunham

FINN, TED
Forks of Salmon
GOOD LUCK MINE, Siskiyou Co, Au

FISHER RESEARCH LAB, INC
1961 University Ave, Palo Alto
SPREAD EAGLE MINE, 5 mi NW of Mariposa, Au
EMMA #1-2 & EMMA MILLSITE, leased from Broheck, Phleger & Harrison, San Francisco)

FITZWATER, G W
Campo Seco
PEERLESS PLACER, Calaveras Co, Au

FLINTKOTE CO
55th & Alameda, Los Angeles
VOORHEIS MINE, Copperopolis, asbestos

FOREMAN, L D & CO
Box 175, Darwin
Pres & Gen Mgr: L D Foreman
DEFENSE MINE, 11 mi S of Panamint Springs, adit, open stoping, Ag, Pb
Prod: 8-tons
SMELTER, Selby

FORKNER, R L
Gen Del, Boonville
FRENCH BAR MINE, Nevada Co, Au

FOSS, A L
Lone Pine
SURPRISE MINE, 11 mi SW of Panamint Springs, adit, open stoping, Pb, Ag, Au

FOSTER & GLORY TINTIC MINES, 1130 Niagara St, Burbank
Owners: Foster Estate & J B Marston
MINE, Valley Wells, open pit, Au, Ag, Cu, Pb, V
50-TON CYANIDE MILL

FOSTER, CLYDE
Nevada City
SLEEPING BEAUTY LODE, Washington dist

FRASER, F W
Orleans
ORCUTT PLACER, Humbolt Co, Au

FRASER, WISE & SHOREY
Box 64, Randsburg
NEW DEAL # 1-3 & YELLOW ASTER MINES, Kern Co, Au, Ag

FRAZIER, CLIFF
North San Juan
TRUDE MINE, Nevada Co, placer, Au

FREDERICKS, R E
3819 34th St, Sacramento
STRAWBERRY BAR PLACER, Nevada Co, Au

FRESNO MINING CO
1739 Terrace Ave, Fresno
Gen Mgr: David D Baker
STRAWBERRY TUNGSTEN MINE, 35 mi N of Bass Lake, shaft, adit, shrinkage & open stoping, W
Supt: M C Richardson
75-TON GRAV FLOT MILL

FRONTZ, GEORGE M
Box 21, Greenwood
CLYSDALE MINE, El Dorado Co, underground, Au

FRYE, HARVEY V
c/o Inskip Inn, Stirling City
MONEY MUSK MINE, Butte Co, Au

GAGE, FRANCIS
1557 S Fairfax Ave, Los Angeles
HI GRADE MINE, lode, Cedar dist

GAMBELL, S F
Junction City
GOLD DOLLAR MINE, 6 mi N of Junction City, hydraulic placer

GARESIO, ALBERT A
Downieville Star Rt, Nevada City
AETNA MINE, 4 mi W of Nevada City, underground, Au, Ag, Cu, dev

GARIBALDI BROS
Volcano
GARIBALDI MINE, Amador Co, Au

GARIBALDI, TONY
Box 146, Pioneer
EMELAINE QUARTZ MINE, East Belt dist, underground, Au

GARRETT, HORD, RALSTON & RALSTON, Box 103, Johannesburg
PIONEER MINE, E of Johannesburg, underground, Au, W
GRAV MILL

GASTONQUAY, ERNEST
Sierra City
PRIDE MINE, Sierra Co, placer Au

GIEGER, EARL
Box 3138, Indio
DUPLEX LODE, Dale dist

GENERAL DREDGING CO
Natoma
Partners: Giddings, Haines & Boucher
PLACER, 2 mi from Folsom, dragline, Au, Ag

GHEZZI & HARRY
158 Tunstead Ave, San Anselmo
LAZAR LODE, Mother Lode dist

GIDDENS, MAYNARD
Nevada City
MURRAY-REMKI MINE, placer, Au

GLENN-STEINTORF CO
3134 E 10th St, Oakland 1
Gen Mgr: G G Glenn
MARBLE SPRINGS MINE, 12 mi E of Coulterville, undgrnd, Au, Ag, Pb
Supt: Jodie Plocher
FLOT MILL

GOBERT, JOHN
Box 202, Downieville
SUNSHINE PLACER, Downieville dist

GOLD BAR MINING CO
Box 10, Altaville, Calif
Mgr: Luke Copanich
ALTA MINE, Mother Lode dist, Au

GOLD COIN MNG & MILLING CO
Greenwood
GOLD COIN MINE, El Dorado Co, underground, Au

GOLD HILL DREDGING CO
311 California St, San Francisco
Pres & Gen Mgr: J J Coney
Sec: L H Kerdell
Purch Agt: E O Perkins
PLACER PROP on Mokelumne R in San Joaquin Co, bucketline, Au, Ag
Supt: H L Coney

GOLD SUGAR GRAND STRIKE MINE & MILL LTD, Box A, Camarillo
Pres: G L Herrington
Sec: Mrs Esther B McDonald
MINE, 9 mi SE of Julian, vein, shaft, adit, open stoping, Au, Ag
20-TON GRAV MILL

GOLD TRAILS MINE DEV
1253 N Harper Ave, Los Angeles
GOLD TRAIL #2 MINE, San Bernardino Co, underground, Au, Cu

GOLDEN CENTER MINE
745 Rowan Bdg, Los Angeles
Owner: Cooley Butler
MINE, Grass Valley, Au
150-TON CYANIDE FLOT MILL

GOLDEN STATE MINING CO
1323 Yosemite, San Jose
QUAIL MINE, Mariposa Co, undgrnd Au
RUTH PIERCE MINE, Hornitos, underground, Au
BALL MILL

GOLDFIELD CONS MINES CO
(See Ariz and Nev listings)
1 Montgomery St, San Francisco
VP & Gen Mgr: E A Julian
OMEGA MINE, Nev Co, hydraulic, Au
RED HILL MINE, Trinity Co, Au

GOLER PLACER
Box 157, Randsburg
Gen Mgr & Supt: D V Cole
MINES, 9 mi NW of Randsburg, dry land dredge, carry-all, Au

GOODHUE, J W
Taylorsville, Plumas Co
PILOT MINE, Genessee, adit with open stoping, Au, Ag, Cu

GOULD, H W & CO
1000 Mills Bldg, San Francisco 4
Pres: B A Gould
VP: H W Gould
Sec Treas: M B Gould
KLAU MINE, San Luis Obispo Co, Hg
Engr: M J O'Boyle
Idle
(See Klau Mine, Inc)

GRAHAM, CHARLES A
330 Alexander St, Nevada City
SELBY HILL MINE, Nevada Co, Au

GRANITE KING
Box 93, Mariposa
Mgr: Frank Carr
MINE, Ag, Au

GRANTHAM, LOUISE
1151 Council Ave, Ontario
RED EAGLE GROUP, Inyo Co, Ag, Pb

GREATER 49er PLACER
Box 1731, Fresno
Owner: Andrew Thickstum
MINE, Strawberry Valley, dragline, Au

GREEN, SHERWOOD
219 S "D" St, Madera
ACE PLACER Madera Co, Au
JENSEN PLACER, Friant Dist
ACOSTA PLACER, Heldrith dist

GREENHORN DREDGING CO
Box 892, Auburn
PLACER, 11 mi S of Placerville, dragline dredge, Au
BARKLEY PROPERTY, Youngs

GROSS, KENNETH
Barrego Star Rt, Julian
KENTUCK MINE, San Diego Co, underground, Au, Ag

GUILDFORD GROUP, GOLD MINES, Box 191, Placerville
Owners: Hollard & McKinnon
MINES: Poverty Point, Fortuna, Humming, Baltic, Bantam, Rose Anita, 2-4 mi N of Placerville underground, Au

HALL, ROBERT A
Box 65, Douglas City
AURORA PLACER, Trinity R dist

HANSON, E
Gen Del, Forresthill
BIG CHIEF MINE, Placer Co, Au

HARPER, ED F
Big Oak Flat,
EUREKA LODE, E Belt dist

HARRIS, D B
Box 4, Trona
SKIDOO MINE, Inyo Co
underground, Au, Ag

HARRIS, JOHN
Redding
NIMS MINE, Box 297, Yreka, Au, Ag, Pb
Engr: C W Yates
75-TON GRAV MILL

HARRIS, MICHAEL
Box 224, Beatty
KEANE WONDER EXTENSION LODE, Chloride Cliff dist

HARRY, ROSS
Sonora
LAZAAR MINE, Tuolumne Co, underground, Au

HATHAWAY, O
Downieville
BUCKSHOT MINE, Sierra Co, Au

HAYDEN HILL MINES
Box 224, Adin
Pres & Gen Mgr: Thomas Goff
Dirs: Herstle Jones & R Zanini
MINE, 15 mi NE of Adin, undgrnd, Au, Ag
125-TON CYANIDE MILL
Met: Joe Shale

HAYES, BEN W
Mariposa
BOULDER CR PLACER, Mariposa Co, Au

HAZEL CREEK MINING CORP
463 Main St, Placerville
Mgr: G W A Irvine
LODE MINE, E Belt dist

HEINS, TED
Barstow
BLUE BELL MINE, Soda Lake dist

HERBERT, O A
Box 67, Plymouth
WOLIN PROPERTY, MotherLode dist, placer, Au

HERBERT MINES
Rt 5, Box 150A, Porterville
TUNGSTEN MINE, Tulare Co

HERSH, R J
1015 Roberta Ave, Glendale
MOJAVE BOY LODE, Silver Mt dist

HESS, MARTIN L
Box 931, Weldon
GLORY HOLE & TUNGSTEN QUEEN, 14 mi S of Weldon, open pit, W dev

HESS, MAX
Box 333, Randsburg
GOLD COIN MINE, Kern Co, lode

HOEFFLER, I W
Box 14, Crescent Mills, Plumas Co
DAG-IAN MINE, vein dev by adit, Au
Supt: Alton Nelson
20-TON GRAV MILL

HOLIDAY, ELMER
Gen Del, Madera
VIRGIL ANDERSON & CASAURANG PROP, Madera Co, placers, Au

HOFFMAN & KING
Box 373, Oro Grande
Mgr: John King
DANDY LODE, Silver Mt dist

HOLMES, H G
Oroville
ROOT JACK LODE, Oroville dist

HOLMESTAKE MINING CO
Box 308, Winterhaven
Pres & Gen Mgr: K A Holmes
CARGO MUCHACHO GROUP, Imperial Co, underground, Au, Ag, W
Supt: Len Hardy
100-TON CYANIDE MILL

HOSTETTER, EDWARD J
Helena
BIG FLAT PLACER, Trinity R dist

HOWARD, D W
1012 Glenoaks Blvd, San Fernando
SUNSHINE LODE, Dale dist

HOWELL BROS
Box 73, Raymond
CHALFANT & FORD RANCH, Madera Co, placers, Au

HOWIE MINING CO
Rm 200, 205 S Beverly Dr, Beverly Hills
Pres: Robert Hodge
Gen Mgr: Ross Prout
HOWIE GROUP MINES, Nevada Co, underground, placer, Au

HUNTER, BEV
Olancha
LEMOYNE CLAIM, Inyo Co, Ag, Pb

HUNTLEY INDUST MINERALS
Box 305, Bishop
Pres: W H Huntley
Sec Treas: L G Hummel
PACIFIC PYROPHYLLITE MINE, 18 mi NW of Bishop, open pit
Foreman: D T Davis
Prod: 100-tons

HYLAND, GEORGE
6105 Castle Dr, Oakland 11
IRELAN MINE, Sierra Co, undgrnd, Au

IDAHO MARYLAND MINES CORP
362 Russ Bldg, San Francisco 4
Pres & Gen Mgr: Albert Crane
VP: Granville Borden
Sec Treas: C L Allan
IDAHO MARYLAND & BRUNSWICK MINES, 1-2 mi from Grass Valley, shaft with square-set, cut-fill & open stoping Au, Ag, 300-tons
Supt: R K Whitmore
Foreman: Charles Nelson
Engr: E C Whiting
1000-TON MILL, grav flot, cyanide
Shiftbosses: C A Berryman, O R Peterson

INDIAN GROUP MINE
Rt 1, Box 489, Grass Valley
Mgr: H R Lewis
INDIAN GROUP LODE, Washington dist

IGO MINING CO
Box 1412, Redding
Pres: R B Tupper
Gen Mgr: M E Hawe
BIG WYKE MINE, Igo, Au, Ag, Pb, Zn
YANKEE JOHN MINE, Au, Ag, Pb
Under dev

INYO MARBLE CO
726-732 E 29th St, Los Angeles 11
Pres: R D Penny
VP: D H Dunn
Sec: G W Mead
Treas: A A Thompson
CONS INYO PORPERTIES, Dolomite via Lone Pine, open pit, Marble & Dolomite
75-TON GRAV MILL
Supt: D H Dunn

IRON DUKE MINING CO
1991 E Glenoaks Blvd, Glendale 6
Pres: Grover Kihorny
IRON DUKE MINE, 15 mi N of Hornios, open stoping, Au
GRAV MILL, DEWATERING PL

IVES, E E
Box 774, Big Pine
CLEVELAND MINE, Inyo Co, Au, Ag

J & W MINING CO
Corvallis, Ore
Partners: Norman Johnson & Chas S Wilson
TYSON CHROME MINE, Gasquot, 20 mi NE of Crescent City, Chrome
Prod: 45-tons
Supt: John Buck
Const Engr: K O Watkins

JACKSON, A E
1614 Trinity, Redding
BRANCH PLACER, Shasta Co, Au, Ag

JACKSON & AUSTIN MILLING
Jackson
KENNEDY MINE, Amador Co, lode, (tailings) Au

JACKSON, R H
Midpines
MEXICAN DIGGINGS MINE, Mariposa Co, underground, Au

JAMES, F D
Lone Pine
LUCKY STRIKE MINE, Alabama Hills dist, lode

JANCIGAYM, FRANK
Jamestown
FARRINGTON MINE, Tuolumne Co, Au

JERSEY LILLY MINE
Randsburg
(Leased to S W Grow)

JOHNS-MANVILLE
22 E 40th St, New York 16, N Y
Ch of Bd: Lewis H Brown
Pres: A R Fisher
VP: K W Huffine
Purch Agt: S F Curtis
LOMPOC MINE, Lompoc, Asbestos, diatomaceous silica, open pit

JOHNSON, FLOYD
La Porte
WINKEYE MINE, Sierra Co, placer, Au

JOHNSON, LOUIS
La Port
ST ELEMO MINE, Sierra Co, placer, Au

JOHNSON MANGANESE MNG CO
255 California St, San Franisco 11
Owner: A W Johnson
GAMLIN MINE Eldorado Co, Au
COFFEE GULCH MINE, Amador Co, Au

JONES, ANDREW B
Box 284, Columbia
HIDDEN TREASURE LODE, Mother Lode dist

JORDAN, ROBERT C
Box 277, Ahwanee
JORDAN DREDGE, Mariposa Co, Au

JOUBERT, JESSIE R
Camptonville
PLACER MINE, Sierra Co, Au

JOUBERT PLACER MINE
Sawyers Bar
Owner: Louis J Joubert
HYDRAULIC PLACER, Au, Ag
(Leased by Strawacker & Hartnett)

JUDGE HYDRAULIC MINE
Sawyers Bar
PLACER, Siskiyou Co, Au

KAISER ALUMINUM AND CHEMICAL CORP, 1924 Broadway, Oakland 12
Pres: Henry J Kaiser
Gen Mgr: D A Rhoades
Mgr: R E Knight

NATIVIDAD DOLOMITE QUARRY,
Box 1531, Salinas, open pit & bucketline, Dolomite, Lime, Mg
Supt: D M Kerr
GRAV MILL, FURNACE, Permanente
Prod: 125,000-tons yearly

KAISER STEEL CORP
1924 Broadway, Oakland 12
Pres: Henry J Kaiser
Exec VP: E E Trefethen, Jr
VP & Gen Mgr: Jack L Ashby
VP & Treas: Atwood Austin
Gen Purch Agt: G W Kelly
Ch Engr: George Havas
EAGLE MT MINE, Box 428, Desert Center, open pit, iron ore
Supt: J G Hansen
Asst Supt: C J Short
Foreman: W A Horton
Mast Mech: C A Scott
RR Gen Fore: O E Olson
SMELTER, Box 217, Fontana, two 1200-ton blast furnaces
Supt: K B Powell
Engr: Geo Huseman

KANE, GROVER
Box 123, Randsburg
OPERATOR CONS LODE, Randsburgh dist

KEANE EXTENSION MNG CO
Box 224, Beatty, Nev
Owners: Michael & James Harris
MINE, Death Valley, Inyo Co, underground, Au, Pb, Fe, Ag
SMELTER, Lead & Iron

KELLY, T C
Hayfork
KELLY MINE, Trinity Co, Au

KEMPLE, G C
Box 55, Goodsprings, Nev
GOLD HILL LODE, Clark Mt dist

KENNEDY MINES
c/o W H Kirklin, Scott Bar
KENNEDY MINE, Siskiyou Co, placer, Au

KENYON & RITTER
Cottonwood
HUMMINGBIRD MINE, Shasta Co, underground, Au

KEYSTONE MINE
Copperopolis
KEYSTONE MINE, Underground, Cu

KING SOLOMON LEASE
Box 101 Johannesburg
YELLOW ASTER MINE, Kern Co, undergroung, Au, Ag

KIRKPATRICK MINING CO
Box 1919, Sacramento
KIRKPATRICK MINE, Downieville dist, placer, Au

KIRKPATRICK
Rt 2, Yreka
100 to 10 & ILAH MINES, Siskiyou Co, Au, Ag

KIRTCHING, R E
Box 783, Big Pine
CRATER GROUP, Inyo Co, S

KLAU MINE, INC
1000 Mills Tower, San Francisco
Pres: B A Gould
VP: H W Gould
Sec Treas: M B Gould
HELEN MINE, Lake Co, Hg, idle
LA JOYA MINE, Napa Co, Hg, idle
VIRGINIA MINE, Plumas Co, Au
STANDARD MINE, Plumas Co, Au, idle

KNEPPER, LW
Idria
NORTH STAR MINE, San Benito Co, surface, Hg

KNOXVILE MINE
Monticello
Owner: G E Gamble & W V Wilson
MINE, Monticello, Hg, furnace
Supt: T S Schribner

KOPPLEMAN, EDWARD
4457 Simpson Ave, N Hollywood
KALLY LODE, Clark Mt dist

KORFIST, JERRY
Baker
MINE, 33 mi NE of Baker, underground dev, Fluorspar

KUBON & JURVA
419 N Emily, Anaheim
RAND MINE, Kern Co, Glenville, W

KYLE, ROGER Q
Box 302, Globe, Ariz
MANGANESE & TREMOLITE MINES, 22 mi N of Blythe, dev

LA GRANGE GOLD DREDGING
Mills Tower Bldg, San Francisco
Pres: Henry Eickhoff, Jr
Sec Treas: Jefferson Koolittle
PLACER, La Grange, dragline, Au, Pt, Iridium

LAKIN, RAYMOND T
Rt 1, Ione
LANCHA PLANA MINE, Amador Co, placer, Au

LANHAM, W L
Camptonville
NEVADA MINES, Yuba Co, Au

LARGHERE, GUISEPPI
Rt 1, Box 142, Nevada City
EAGLE BIRD MINE, Downieville dist, Sierra Co, underground (dump) Au

LAURIDSON, LAUREN C
Rt 2, Box 1340, Fair Oaks
JAMES O'BRIEN MINE, El Dorado Co, placer, Au

LAVA CAP GOLD MINING CORP
River Road, Ansonia, Conn
Pres: Leslie H Jockmus
Sec Treas: Harry C Powley, Jr
MINE, Nevada City, Au, Ag
400-TON CYANIDE FLOT MILL, idle

LAVERONI, T A
Rt 1, Sonora
JOSEPH MINE, Tuolumne Co, Au

LAWRENCE, JOSEPH S
Pine Grove
HAPPY JOE & JUMBO CLAIMS, Amador Co, underground, Au

LEEDOM, W R
Box 1, Chinese Camp
EAGLE SHAWMUT MINE, Tuolumne Co, underground, Au

LEWIS, FOSTER L
2307 Shasta St, Redding
STARVATION MINE, Trinity Co, udgrnd, Au

LIDDICOAT GOLD MINES CO
Rt A, Box 27, Greenwood
Pres: J L Liddicoat
VP: L G McClain
Sec: Lillie Liddicoat
GRIT MINE, underground, Au
Engr: J F Siegfried
60-TON GRAV FLOT MILL, dev

LILLY, E L
1640 E Poplar St, Stockton
PLACER, 7 mi NW of Plymouth, dragline, Au, Ag

LINKHARD, R & E MESSENGER
Kirby, Ore
CHROME MINE, Siskiyou & Del Norte Co

LIPPINCOTT LEAD MINES
Box 1811, Santa Ana
Owner: George Lippincott
LEAD KING MINES, Death Valley, Ag, Pb, Zn
Prod: 50-tons
Supt: Gene Taylor
GRAV FLOT MILL, Furnace, 25-tons
Supt: Neuman Belk
SMELTER, under dev

LITTLE, EMMOR & SONS
Box 584, Yreka
STAR CLAIM, 11 mi W of Yreka, dragline placer, Au
SLATE MT MINE, 8 mi NE of Georgetown, underground, Au, idle
10-STAMP MILL

LITTLE, J Q
Clark Mt Station, Nipton
CARBONATE KING MINE, San Bernardino Co, Ag, Pb, Zn
(Owned by Crystal Cave Mining Co)

LIVE OAK MINES, INC
Sand Canyon, Rt 1, Saugus
Pres & Gen Mgr: Challoner Thompson
Counsel: H C Ellis
MINES, 12 mi SE of Saugus, open pit Ilmenite, Magnetite, Zirconium
Met, S Sklarew

LLEWELLYN, LLOYD
Box 62, Ridgecrest
DAN PIER MINE, Rademacher dist, lode

LOG CABIN MINES CO
431 W 7th St, Rm 826, Los Angeles
Gen Supt: F C Cassidy
LOG CABIN MINE, Leevining, Au, Ag
150-TON AMAL CYANIDE MILL, Dev

LOMAR MILLING CO
Box 39, Pine Grove
FORT ANN MINE, Amador Co, Au

LONE STAR MINING CO
Box 8, Claraville
Mgr & Part: J E Moreland
Asst Mgr & Part: W E Moreland
Partner: Mattie Moreland
LONE STAR MINE, Au, Ag, W, Dolomite
MILL at mine

LOOMIS, L W
Box 328, Placerville
L & L MINE, W of Placerville, open pit, Au, 300-tons

LORENTZ & SWINGLE
Plymouth
Mgr: C J Lorentz
LORENTZ EXT PLACER, Cosumnes R dist

LOVE, DONALD F
Ludlow Box B
BAGDAD-CHASE MINE, 8 mi S of Ludlow vein, shaft, open stoping, Au, Ag, Cu
Met: Jalmar & Jackson
Prod: 500-tons monthly

LOW, F GILMAN
Box 224, Ahwahnee
NEW DAL MINE, Au

LOWRY, GLENN C
Box 227, West Point
EMILY MINE, Amador, undgrnd, W

LUCKY GOLD HILL CO
645 Gray Ave, Yuba City
Pres: I B Everett
VP: Charles Lavis
Sec Treas: Harold Lindstrom
Gen Mgr: Harry Garner
LUCKY GOLD HILL GROUP, 9 mi S of La Porte, placer, Au
400-TON MILL, under const

LURCOTT, CHARLES E JR
Darwin
LEE LODE, Lee dist

LYONS, F & E MATHERLY
1377 Norton St, Oroville
DREDGE, Pilliken, Stodick & Wenton prop, El Dorado Co, Au

LYTTLE, R B
2821 Sichel St, Los Angeles 31
BLEW JORDAM ZINC MINE, vein dev, Zn, Pb, Ag, Cu

MACHEN, H E
North San Juan
BRIDGEPORT MINE, Nevada Co, Au

MADER, LAURENCE J
Box 350, Grass Valley
W M C PLACER, Nevada City dist

MADISON, MRS H E
Forbestown
EL SEGUNDO PLACER, Forbestown dist

MAGEE MERCURY, INC
4163 Piedmont St, Oakland
Pres: H H Magee
VP & Engr: B C Austin
Sec: H B Rucker
MINE, Guerneville, Hg
Mgr: T A Monahan
100-TON ROTARY FURNACE

MAID OF ORLEANS MINE
Alleghany
OWNERS: Wolf & Assoc
GOLD MINE, dev
Supt: George Bartlett

MAIN, M L
Lewiston
COOKHICKY PLACER, Trinity R dist

MALONE MINE
Box 223, Mariposa
MINE, Mariposa Co, Au, Ag
Operators: De La Mare & Johnson

MARALL, L S & V H
Forest Hill
CHROME MINE, Placer Co, Cr

MARBLE CANYON CORP
Big Pine
HALLALUJA MINE, Big Pine dist, placer

MARBLE SPRINGS MINE
c/o Click Henderson, Coulterville
MINE, underground, dev, Au

MARBLE TUNGSTEN MINE
Bishop
MINE, 13 mi SW of Bishop, dev
Supt: A H Peterson & John Utter

MARKON, ALEX
Sawyers Bar
WHITES GULCH PLACER, Salmon River dist

MARQUIS, J M
425 San Mateo Dr, San Mateo
MARQUIS MINE, Calaveras Co, underground, Au

MARTER MINING CO
701 Security Title Insurance Bldg, Los Angeles
Pres: L B Martin
Gen Mgr: R M Richter
MARTER-WHITE MINE, San Bernardino Co, open pit, 500-tons
LUCERNITE MINE, San Bernardino Co, open pit, Mn Ca Carbonate, 100-tons

MARTIN, LENN O
Darwin
EMPRESS LODE, Case Dist

MARY LEN MINES
Newcastle
MINE, Placer Co, Au, Ag

MASSERA, E F
Star Rt, Nevada City
COMET PLACER, Nevada Co, Au

MASTOLIER, S
Tuler Rt, Nevada City
SALMON MINE, underground, Au

MATHERLY, E B
Folsom
LYONS & MATHERLY DREDGE, Placers, Folsom dist

MATTHEWS, PEARCE & UNDERWOOD, Hollister
ANTELOPE MINE, 33 mi SE of Hollister underground, Cu

McCONNELL, S W
Box 56, El Dorado
NASHVILLE MINE, Placer Au

McCULLEY, JOE
Box 53, Darwin
EMPRESS MINE, 8 mi E of Darwin, underground, Pb, Zn, Ag, Cu, Au
BIG FOUR MINE, 15 mi E of Darwin, Panna Mint dist, Pb, Zn, Ag
OLD DEPENDABLE MINE, 23 mi SW of Furnace Cr Ranch, underground, Sb, Ag

McFALL & GROND
Box 7392, El Cajon
EAGLE NEST CLAIMS # 1-4, San Diego Co, underground, Au, Ag

McGINNIS, R B
Scott Bar
QUARTZ HILL LODE, Scott R dist

McHENDRY, L W
Lewiston
HICKEY PLACER, Trinity Co, Au

McPHERSON, DON
Trona
SMUGGLER GROUP, San Bernardino Co, underground, Ag

McPHERSON, J L & R B
1300 9th St, Antioch
CLIO KERSHAW LODE, Mother lode dist

MEANS, L R
Box 717, Yreka
OSGOOD MINE, placer

MEEHL, LOUIS J
RFD 1, Box 2A, Mohave
STANDARD MINE, Mojave dist, lode

MENGIN, PIERRE
Happy Camp
PATSY PLACER, Siskiyou Co, Au

MERIAN, A T
Strawberry Valley
JUMBO MINE, Plumas Co, Au

METZGER, CHRIST
Alleghany
MARIPOSA MINE, Sierra Co, underground, Au

MID-STATE DREDGING CO
Rt 1, Box 13, Le Grand
MID-STATE DREDGE, THOMAS RANCH, Mariposa & Merced Co placer, Au

MILLER, GEORGE & JOHN
Box 681, Sonora
GOLDEN STAR LODE, E Belt dist

MINERAL MATERIALS CO
1145 Westminster Ave, Alhambra
Part & Mgr: C W Dunton
ATLAS SILICA QUARRY, 2 mi E of Oro Grande, open pit, 700-tons
STARBRIGHT MINE, 25 mi N of Barstow, open pit, W, 30-tons

MINONA MINING CO
118 S School St, Grass Valley
BUCKEYE HILL MINE, Nev Co, Au

MITCHELL, STEVENS & DREW BROS, Randsburg
CALIF CLAIM, Kern Co, undgrnd, Au, underground, Au, Ag

MODGLIN, ANDREW
La Porte
WILD ROSE PLACER Poker Flat dist

MODRELL & WARREN
Murphy's
THOS BISHOP PROP, Calaveras, Au

MOHAWK MINES, INC
Nipton
Pres: T W Peterson
VP: Lorin Reber
Sec & Gen Mgr: S C Greenwood
Treas: R N Day
MOHAWK MINE, 65 mi S of Las Vegas, vein, shaft & adit, Pb, Cu, Ag, Zn

MOLINI, SCOTT & DUNNIGAN
Dyer, Nev
ALEXANDER MINE, Inyo Co underground, Ag, Pb

MOLYBDENUM CORP OF AMER
(See North Eastern listing)
Gen Mgr: H D Bailey
Asst Gen Mgr: Russell Wood
Met: A M Wilson

MONUMENTAL MINES
520 F St, Eureka
Operators: Matthews & Nelson
MINE 7 mi W of O'Brien, open pit, Au, Ag, dev

MOON, E O
4233 Berryman, Culver City
KOLLEY MINE, San Bern Co, Ag, Pb, Zn

MOONLIGHT MINING CO
Coulterville
MINE, Mariposa Co, undgrnd, Au

MORGAN GOLD MINING CO
Georgetown
Mgr George P Morgan
MINE, Garden City, dev, Au

MORGAN, J J
Denny
HIGHLAND PLACER, Trinity R dist

MORNING STAR MINING CO
6300 Acacia Ave, Oakland
Mgr: G C Gary
LODE MINE, Monitor dist

MORRILL, M A
Rt 1, Box 103A, Laton
ELI MARIA CLAIM, Mariposa Co, underground, Au

MORRIS RAVINE MINING CO
Box 7, Oroville
PLACER MINE, Oroville dist

MOUNT GAINES MINING CO
Hornitos
60-TON AMAL FLOT MILL, Au, Ag
Mgr: J L Dynan
Mine Fore: A J Meagher
Mill For: C S Guest
Assay: T W Molthen

MT RAYMOND MINES
Box 777 Madera
STAR & BILEDO GROUPS, near Madera, Au, Ag, Cu, Pb, Zn
Owners: Smith & Bradford

MOUNTAIN COPPER CO, LTD
216 Pine St, San Francisco 4
Gen Mgr: L T Kett
Asst Mgr: J G Huseby
Purch Agt: S D Dodds
Gen Supt: C W McClung
HORNET MINE, 15 mi NW of Redding, adit, Fe
Supt: T P Bagley
Foreman: H Calhoun
Engr: Albert Parr
HORNET CRUSHING PL
Prod: 1000-tons

MOUNTAIN GOLD DREDGING CO
Sutter Creek
Pres: M J Garibaldi
Gen Mgr: C R Garibladi
PLACER, 2 mi E of Valley Springs, dragline, Au
Mech Engr: Bill Teller

MOUNTAIN KING MILL & MINE
410 Thorne Ave, Fresno
Pres: C W Stewart
MINE, Copperopolis, Au, Ag
700-TON AMAL FLOT MILL
Supt: T B Rice
Engr: H E Bush

MT PASS MINE
Nipton
RARE EARTH MINE, 60 mi SW of Las Vegas, Nev, 80-tons
Supt: F C Rowe
MILL, Grav Flot & Leaching
Supt: A M Wilson

MT VIEW LEAD MINE
Independence
Mgr: Pritchett & Slater
MINE, Inyo Co, AgPb

MUROC CORPORATION
Mariposa,
MOUNT GAINES MINE, cleanup lode
Hunter Valley dist, idle

MURRAY, DAYTON
8th & B Sts, Eureka
NELSON PLACER, Orleans dist

MURRAY, HARRY
Box 232, Nevada City
PLACER, Nevada Co, Au

MUTH, TED
Somes Bar
RIVERSIDE PLACER, Siskiyou Co, Au

NALIVIKO, ALEX
Lewiston
TRINITY RIVER LODE, Trin R dist

NATIONAL LEAD CO, BAROID SALES DIVISION
830 Ducommun St, Los Angeles
HECTOR MINE & PLANT, Newberry, underground, Bentonite
Supt: Jack Herford
EL PORTAL MINE & PL, El Portal, underground, wet grnding of Barytes
Supt: R B Spitzer
MERCED MILL, Merced, dry grnding of Barytes
(See Tex, Nev & South Central listings)

NATOMAS CO
607 Forum Bldg, Sacramento
Pres & Gen Mgr: R G Smith
Sec: Wanda Durkee
GOLD DREDGING DIVISION
Asst Mgr: Cyril Thomas
MINE, Natoma, bucket dredge, Au

NELSON, J D
Happy Camp
HAPPY 3 PLACER, Klamath R dist

NEVADA SCHEELITE
11320 S Alameda St, Los Angeles
CONCENTRATE

NEW CHAMPION MINING CO
West Point
CENTENNIAL MINE, underground, Au, Ag, Pb
Supt: H G O'Hanlon Jr
Foreman: Dean Aghetti
FLOT MILL
Supt: R H O'Hanlon

NEWA MINING CORP
Star Rt 1, Box 49A, Lancaster
NEWA MINE, Neenach dist, lode

NEWCOMB, ZELMA
Downieville
NEWCOMB MINE, Sierra Co, Au

NEW ERA MNG & MILNG CO
Big Pine
Mgr: W C Hove
NEW ERA MINE, Inyo Co, underground, Au, Ag

NEW IDRIA MNG & CHEM CO
58 Sutter St, San Francisco 4
Pres: Gordon I Gould
VP: E L Elliott
Sec Treas: C S Balch
NEW IDRIA QUICKSILVER MINE, Idria, 165 mi S of San Francisco, Hg, adit
Prod: 100 tons
Supt: C H Lewis
Engr: Wes Shadduck
NEW IDRIA MILL, 4 Gould rotary kilns
Prod: 400 tons

NEW JAMISON MINE
Box 128, Johnsville
Mgr: C H Smith
LODE & PLACER, Johnsville dist

NEWMAN, OTTO & SONS
Wilmar Apts, Auburn
MOHAWK MINE, 12 mi NE of Forest-hill, placer, Au, dev

NEWMONT MINING CORP
(See Empire Star Mines Co, Ltd)

NEW TRAIL MINING CO
Cima
Sec: J D Loop
NEW TRAIL & ANCHOR SHAFT, Clark Mt dist, Au, Ag, Pb

NICHOLS, FRANK
Sawyers Bar
NEW DIGGINS MINE, Siskiyou Co, placer, Au

NICKELL, E O
Baker Ranch, Foresthill
ORE PLACER, Placer Co, Au

NOBLES, ERNEST
Raymond
MERRICK BROWN PROP, Madera Co, dredge placer, Au, Ag

NORMAN, J T
Cathay
MINE, Mariposa Co, undgrnd, Au

NORTHWESTERN MINING CO
Box 3191, Seattle, Wash
Owner: Alfred W Peeler
BOULDER GULCH GROUP, Siskiyou Co
HYDRAULIC PLACER, Sawyers Bar, Au
Supt: Richard T Bendl

NYSTROM, GUST
Box 42, Big Oak Flat
MORHAM MINE, Groveland, Au, Ag

OBARR, WILSON A
602 S Van Ness St, Santa Ana
LEON MINE, Riverside Co, undr-grnd, Au, Ag

OCEAN VIEW MINE
Big Sur
Mgr: John R Lowe
MINE, Monterey Co, Au, Ag

O'DONNELL, JOHN
326 E Main St, Grass Valley
KATE HARDY MINE, Sierra Co, underground, Au
BALL MILL

OLSON, ROY S
1176 Walnut Ave, Redding
Battams Prop, Shasta Co, Dredge, Au, Ag

ORA DEL LOMA CO
Del Loma
FRENCH BAR PLACER, Trinity River, bucket highline, Au
WASH PLANT

OREGON GULCH GOLD DREDGING CO, Weaverville
Mgr: Ed Shuford
LA GRANGE PLACER, tailings, Trinity R dist

ORIGINAL 16 to 1 MINE, INC
1611 Russ Bldg, San Francisco 4
Pres: A N Lewis
Sec: Jack Maxfield
MINE, Alleghany, Au, Ag
Supt: W Van Doren
Purch Agt: C A Bennett
150-TON CONC & AMAL PLANT
Supt: John Hunley

ORO FINO CONS MINES CO
Auburn, Box 432
Pres: G A Nugent
Treas: J C Kempvanee
ORO FINO MINE, 4 mi from Auburn, shaft, shrinkage stoping, Au, Ag, idle

OWL SPRINGS CO
1079 Leighton Ave, Los Angeles 37
Pres: Harold W Orwig
Sec: George Orwig
MANGANESE MINES, San Bern Co, underground, open pit, Mn
Assay: Edward Eisenhauer Jr
50-TON CONC & SINTERING PL

PACIFIC ATLANTIC METALS
513 Central Bldg, Pasadena
Chairman: W W Kaye
Pres: E C Neckerman
COPPER BASIN, GOLD PEAK, COW-BOY, EDITH & BLACK HAWK MINES, Caliente, Au, Ag, Pb, Zn
Supt, Gold Peak & Cowboy: Willard Hales
Supt, Black Hawk: H A Hukill
FLOT MILL & REDUCTION PL

PACIFIC COAST BORAX CO
DIV of BORAX CONSOLIDATED LTD
510 W 6th St, Los Angeles 14
Pres & Gen Mgr: J M Gerstley
VP: P J O'Brien
Purch Agt: J C Walker
Gen Supt: Lloyd Fusby
Ch Engr: G T Olen
Ch Chem: Vincent Morgan
BORON MINE, undgrnd, Borate ores
Supt: V C Rogers
Foreman: F A Conte
BORON PLANTS
Supt: E D Lemon
Asst Supt: D Vary
Mast Mech: N E Ross

PANAMINAS, INC
c/o Eureka Corp, Eureka, Nev
Pres: G W Tower
Gen Mgr: G W Mitchell
ADAMSON MINE, Bishop, W

PARKER MNG & MILLING CO
Box 202, Barstow
Pres: F A Parker
VP: J C Porter
Sec Treas: H T Parker
Geol: Eugene Lawrence
Engr: Wade Whaley
WHITE DOLLAR MINE, 14 mi S of Daggett, open pit, dozer, 40-tons
GRAV MILL, 2 mi W of Barstow, 40-tons

PARKER, BRUCE H
Midpines
CHILAMAN MINE, Mariposa Co, placer, Au

PARKER, R W
Klamath River
DUMLUCK MINE, Siskiyou Co, Au

PARKER, WILLIAM F
Midpines
BUCKSKIN MINE, Mariposa Co, placer Au

PARTAIN, Z L & ASSOCIATES
713 9th Street, Sacramento
TRAP LINE, Michigan Bluff district, placer

PAULSON, C W
789 Bridgeway, Sausalito
NIAGARA SUMMIT MINE, Shasta Co, underground, Au

PAYNE, THOMAS
Dobbins
PAYNE MINE, Yuba Co, Au

PEDRO, WILLIAM R
Sonora
PEDRO MINE, East Belt district, lode

PEERLESS DEVELOPMENT CO
235 Bancroft Ave, San Leandro
Pres & Gen Mgr: B K Malville
PEERLESS MINE near Greenville, underground, Au

PENDLETON, W B
Foresthill
AMERICAN HILL MINE, Last Chance district, placer, co, Au

PENN CHEMICAL CO
Campo Seco
Pres: C F Fisk
VP: R L Harp
Sec: Rod Barklov
Gen Supt: Harold Hansen
Met: Hugh Coke
Geol: Francis Frederick
Elec Engr: Chas. Lee
Mech Engr: Austin Boreham
PENN MINE, 2 mi from Camp Seco, vein mined by shafts & shrinkage stoping, Zn, Cu, Pb, Ag, Au
Mine Foreman: O G Cruickshank
Prod: 75 tons
PENN FLOT MILL
Supt: Arthur Dirrim
Foreman: Harold Cruickshank
Assay: G H Scibird

PERKINS, I STANLEY
Rt 4, Box 4818, Paradise
NEW ERA MINE, Butte Co, placer, Au

PERLITE INDUSTRIES, INC
2332 Ave, Los Angeles 16
Pres & Gen Mgr: Charles H Harrington
VP: Kenneth B Hysong
Treas & Mgr: William E Hysong
VP & Mine Supt: W R McGowen
Sec & Mill Supt: Ralph C Harrington
GREY EAGLE MINES #1, 2, & 4 at Tecopa open-pit, Perlite
Asst Mine Supt & Purch Agt: B B Bedeynak
Asst Mill Supt: Charles Wuagh
Mill Foreman: John Wheat
Mech Engr: Walton R Manuel
100-TON FURNACE
600-tons prod

PERMIT MINING CORP
Midpines
PERMIT & NUTMEG MINES, Mariposa, Co, underground, Au

PESTLE MINE
P.O. Box 94, Randsburg, under-ground, Au
Owner & Operator: S M Mingus
under dev

PETERSON, NELSON
5250 Bennet Valley Road, Santa Rosa
OSCAR HAGEN CLAIM MINE, Mariposa Co, underground, Au

PETERSON, T B
P O Box 186, Randsburg
LUCKY BOY MINE, 2 mi S of Rands-burg, underground, Au
under dev
TUNGSTEN MT GROUP MINE, 8 mi W of Randsburg, underground, W

PHILLIPS, H J
Rt 1, Box 577, Chase Rd, El Cajon
PHILLIPS MINE, 2 mi SE of Clayton, vein mined by shaft, adit & cut-&-fill stoping, Au, Cu, Pb
AMAL-GRAV MILL
under dev

PHILLIPS, W C
North San Juan
BUCKHORN PLACER MINE, Au, Ag
under dev

PIERCE, V F & W H RIDDLE
Pioneer
ELKHORN MINE, East Belt district, lode
lode

PINNACLE MINING CO
Independence
ROUND VALLEY MINE, Inyo Co, 10 mi NW of Bishop, underground, W
GRAV MILL

PINTO BASIN MINING & MILL-ING CO
7940 Sunset Blvd, Los Angeles
MISSION MINE, Dale district, lode
GOLDEN ROD MINE, Dale district, lode

PIONEER PYROPHYLLITE PRO-DUCERS
Box 686, Chula Vista
Pres & Gen Mgr: Dorothy Benner
OPEN PIT MINE in Rancho Santa Fe Mining district, Pyrophyllite
Mine & Mill Supt: Ferrar Matthews
Mine Foreman: Haroid Smiley
Mill Foreman: Robert Wilson
Elec: Elliot Williams
50-TON GRINDING PL

PITTSBURGH PLATE GLASS CO
Bartlett
Mgr: George D Dub
MINE at Bartlett, Inyo Co, chemicals
Asst Supt: Clark Dudke
Ch Chem: O M Knowles
Mast Mech: G E Snyder

PLACERVILLE GOLD MINING CO
Box 191, Placerville
Pres: Reginald Owen
Sec & Treas: L F S Holland
PACIFIC, OREGON HILL, EPLEY, HARMON, EXCELSIOR, TEXAS HILL & MISSOURI FLAT MINES, hardrock & placer, Au
GRAV-FLOT MILLS

POLIDORI, PAUL
Del Loma
4-C MINE, Trinity Co, placer, Au

POOL, MATTIE M
Joshua Tree
MINE in San Bernardino Co, Au

PORTEOUS, HERMAN
Ione
APEX MINE, Calaveras Co, under-ground, Au

PROVIDENCE TUOLUMNE GOLD MINES, LTD.
210 Post St, San Francisco
Pres & Gen Mgr: A Vannini
Sec: R Freeborn
PROVIDENCE MINE, 11 1/2 mi SE of Sonora, underground
150-TON MILL Tuolumne

PURINTON, L A
398 W San Fernando St, San Jose
Dredge on Fine Gold Creek, Haldrith district

QUARTZ HILL MINING CO, INC
Scott Bar, Siskiyou Co
Pres: L J Cuneo
VP: C Garibotti
Gen Mgr: R B McGinnis
Gen Supt: J A Vinson

QUARTZ HILL MINE, Scott Bar, open pit, Au, Ag
Mng Engr: H B Thompson
Elec Engr: E E Miller
Assay: R Bauerstock
500-TON GRAV MILL
Supt: E M Smith

QUASEBARTH, A F
Box 172, Winterhaven
ALPINE MINE, 5 mi N of Ogilby, underground, open pit, Au, Ag
CYANIDE GRAV MILL, dev

QUICK, HARRIS HALL
Box 162, Randsburg
MINNESOTA & JOSEPHINE MINES, Kern Co, underground, Au, Ag

QUINN, BERT
Box 71, Darwin
SILVER SPOON LODE, Coso dist

QUINN, J R
Sloughouse
PLACER, Cosumnes River dist

RAISEK, L A
Newberry
IMPERIAL LODE, Lava Bed dist

RAMSEY, CHARLES
Camptonville
OVERSIGHT PLACER, Camptonville

RAY, FRED
French Gulch
BRUNSWICK LODE, Fr Gulch dist

RALSTON, R E
Box 103, Johannesburg
PIONEER MINE, San Bern Co, underground, Au

READ, DONALD
Box 84, Nevada City
CITY OF SIX & GOLDEN BEAR MINES, 3 mi S of Downieville, lode dev by shaft, adit & Placer, Au

REASONER, P
Dutch Flat
LIBERTY HILL MINE, Nev Co, placer

RED DOG
Star Rt, Santa Barbara
Mgr: W G Osborne
MINE, Inyo Co, Au, Ag, Pb

RED HILL MILL
Bishop
SMELTING & REDCTION, W

RED INK MINING CO
7214 Sepulvia Blvd, Van Nuys
WHITMORE MINE, Mojave dist, lode

RED PORPHYRY MINE
c/o H R Tuttle, Hilt
MINE, Siskiyou Co

RED WING MNG & MILNG
207 Haberfeld Bldg, Bakersfield
Pres & Gen Mgr: Fred Risely
VP: C C Scharheuberg
YELLOW TREASURE MINE, Ridge-crest, Au, Ag, Cu
Engr: A M Brooks
Foreman: P A Liebel
Met: Ed Eisenhauer

REEDER, W W
Klamath River
REEDER & INGRAM MINES, lode & placer, Klamath R dist

REEL, ROY R
Schilling
GRIZZLY BEAR MINE, Shasta Co, underground, Au

RELIEF HILL MINE
c/o A P Landsburg & Jim Swazey, Nevada City
MINE, North Bloomfield dist, placer, Au, Ag
Owner: Western Gold, Inc

REX MINE
Box 324, Weaverville
MINE, Trinity Co, placer, Au

REX MINING CO
Box 623, Carson City, Nev
Pres: J C Skottowe
VIRGINIA & JOSEPHINE MINES, Coulterville, dev
Engr: G S Kearney

RICHTER, WM & SONS
Rt 2, Box 400, Oroville
PLACER, dragline dredge, Au
Prod: 15,000 yds monthly

RIEUNCHE, GEORGE
Rt 2, Box 514, Acampo
COOK PLACER, Calaveras Co, Au

RIGGS, ROBERT A
1237 S Greenwood Ave, Montecillo
SAN GABRIEL VALLEY PLACERS, 2 mi W of Azusa, Au, Ag

RINCONADA QUICKSILVER
Box 37A, Santa Margarita
Owner: G R Bell, etal
OPEN PIT & underground mine, Hg, Mn
50-TON FURNACE

RIVER PINE MINING CO
141 Battery St, San Francisco 4
DREDGE, El Dorado Co, Au, Ag

RIVER ROCK INC
345 38th St, Oakland
Mgr: B M Dolan
GRAVEL PLACER, Merced Co, Au

RIZZARDINI, A
Box 352, Randsburg
BIG DYKE MINE, Kern Co, undergrnd Au, Ag

RIZZARDINI & WILKINSON
Box 106, Johannesburg
FLORENCE MINE, Kern Co, underground, Au, Ag

ROBLIN, ERNEST
Mariposa
WHITLOCK DUMP, E Belt dist

ROCK, WALTER
Chinese Camp
MENKE HESSE MINE, Tuolumne Co, placer, Au

ROHDE, JOHN
Quincy
GOLD LODE, 4 mi N of Quincy, vein dev by adit, Au

ROMBOUGH & MITCHELL
3069, Del Paso Blvd, Sacramento
NATOMAS TAILINGS, Folsom dist

ROSE, S N
La Grange
JUMBO MINE, Calaveras Co, Au

ROUBLE, LAWRENCE
2167 Marshall Way, Sacramento
STARBUCK PLACER, El Dorado Co, Au

ROWE, MULLINIX & BUEHLER
1555 Sunset Ave, Pasadena 3
Pres: W N Rowe
Gen Mgr: W C Buehler
Sec & Purch Agt: Jeanne Mullinix
REGAL HILL GROUP, Newburg Springs undgrnd, open pit, bucket dredge, Au, Ag, Cu, Pb, V
10-TON FLOT MILL
Supt: D C Hare
Asst Supt: Dick Lanier

ROYAL DRIFT MINING CO
Box 76, Magalia
Pres: J W Turner
MINE, Magalia, undgrnd, Au, dev

ROYAL MINE
c/o Joe Faltor, Copperopolis
Owner: Frank S Towler
MINE, Calaveras Co, Au, Ag

RUSSELL, GEORGE W
Isabella
MAMMOTH MINE, underground
10-STAMP MILL, dev

SAGER, S
Nevada City
SALMON LODE, Washington dist

SALMON RIVER MINES CO
Callahan
Pres & Gen Mgr: E C Latchem
Purch Agt: V W Peterson
TRAIL CREEK MINE, Dev, Au
50-TON FLOT MILL

SARDONYX MINE
Johannesberg, Sb
OPERATOR, J L Foisie

SARGENT, A M
Weison
DONNIE QUARTZ MINE, Kern Co, underground, Au, Ag

SARITA MILLING CO
Box 763, Bridgeport
Pres: Louis W Cramer
Sec Treas: A M Buranck
Gen Supt: Page Blakemore Jr
CHEMUNG, SARITA MINES, 8 mi NE of Bridgeport, shaft, open pit, Au, Ag
90-TON CYANIDE MILL

SAVERCOOL CLAIMS
Greenville
Owner: Kenneth Murray

SCANDIA MINES
5361 Stockton Blvd, Sacramento
MINE, Siskiyou Co, Placer, Au, Ag

SCHOFIELD MINING CO, INC
Matheson Rt, Redding
JEALOUS MINE, Redding dist, lode

SCHROEDER MINES
Box 169, Mariposa
MINE, 12 mi N of Mariposa, adit, Au
20-TON MILL

SCHULTZ, FRANCIS
Greenville
RUSH CREEK MINE, Plumas Co, Au

SCHWARTZ & MITCHELL
Rt 2, Box 1783, Roseville
S & M MINE, Placer Co, Au, Ag

SCHWOERER, LOWELL F
Box 22, Vallecito
RED HILL LODE, Mother Lode dist

SCOTT, J H CO
Merchants Exch Bldg, San Francisco
WASHINGTON MINE, French Gulch, Au
75-TON FLOT MILL

SCOTT, JAMES I
745 Locust St, Redding
MURPHY LODE, Forest Glen dist

SEAVERS, MARY
Mariposa
COW & CALF LODE, Mother lode dist

SECURITY GOLD MINING CO
Downieville
BIG BOULDER PLACER, below Gold Valley, Au, dev

SEFERS, FRANK
Box 421, Nevada City
S YUBA PLACER, Nevada Co, Au

SHADOW MT MINES
Nipton, c/o Edna McHenry
MINE, San Bern Co, Ag, Pb

SHANNON & PIERSON
Big Pine
CLEVELAND MINE, Inyo Co, underground, Ag, Au

SHARP, R B
Bear Valley
LUCKY BOY MINE, Mariposa Co, underground, Au

SHAWNEE MINE
Box 572, Chico
Mgr: F A Willis
PLACER, cleanup, Butte Cr dist

SHEARER, W K
Jamestown
HESLOPLODE, Mother Lode dist

SHEEN, W R
Box 172, Ione
JOSEPH BARNES PROP, Ione dist, placer

SHERMAN PEAK MINING CO
Box 583, Kernville
SHERMAN PEAK & HILL TOP MINES, Tulare Co, underground, open pit, W
90-TON GRAV MILL, dev

SHOEMAKER, O H
Trinity Center
BUCKEYE PLACERS MINE, 2 mi N of Trinity Center, open pit, placer

SHORE, FRANK
Rt 2, Sonora
SHORE MINE, Tuolumne Co, undgrnd, Au

SHOREY, D & KEMP, R
Box 13, Greenwood
NEW MACHINE MINE, El Dorado Co, placer, Au

SHULTS BROS
Box 127, Medford, Ore
MINE, Patricks Creek, Hg

SIERRA COPPER CO
920 Burchett St, Glendale
DONNER LODE, Jenny Lind dist

SIERRA MONARCH GOLD MNG
709 10th St, Richmond
SIERRA MONARCH LODE, Sierra dist

SIERRA TALC & CLAY CO
5509 Randolph St, Los Angeles 22
MINES, Keeler, Tecopa & Shoshone, Inyo Co
TALC MINE, San Bernardino Co
MINE, Saline Valley & Ubehebe dist

SIEVERS, P F
Box 24, Clements
MOKELUMNE PIT MINE, San Joaquin Co, placer, Au

SISKON MINING CORP
Happy Camp
Gen Mgr: Hugh Wright
MINE, SW of Happy Camp, Au, Cu
LEVIATHAN MINE, Alpine Co, Cu

SKINNER, W V
625 Muir Ave, Lone Pine
UBEHEBE LODE, Ubehebe dist

SMITH, AA & WB
Box 158, Downieville
CHINE SLIDE MINE, Sierra Co, Au

SMITH, ERNEST D
Box 725, Madera
MINE, 16 mi NE of Madera, placer, Au

SMITH & SPELL
Box 347, Twentynine Palms
ORO MEGA MINE, San Bernardino Co, underground, Au, Ag, Pb, idle

SMITH, R B
MT DIABLO MINE
(See Bradley Mining Co)

SMITH, ROBERT H
Box 110, Johnsville
FOUR BIT MINE, Plumas Co, placer, Au

SMITH, POLSON & MARTINSON
Box 149, Lancaster
Mgr: Harry D Smith
SYLVIA MINE, lode

SMITH & RUBENS
Box 85, Folsom
NORTH COLUMBIA MINE, Nevada Co, dredge, Au, Ag

SMITH, SIDNEY E
Gen Del, Alleghany
FREIDA HARDIE PROP, Sierra Co, placer, Au

SMITH, VICTOR L
La Porte
JOURNEYS END PLACER, La Porte dist

SNAPP, ELMORE
249 Church St, Oakdale
LITTLE STAR LODE, E Belt dist

SNELLING GOLD DREDGING
Snelling
DREDGE, Merced Co, Au, Ag

SNOW-STORM PLACER
Columbia
PLACER, Tuolumne Co, Au

SNYDER, D A
Rt 1, Box 12, Ashland, Ore
GRANITE MT LODE, Klamath R dist

SNYDER, VERNE
Raymond
LEW REGAN PROP, Madera Co, Au

SONOMA QUICKSILVER MINES
58 Sutter St, San Francisco 4
Pres: H D Tudor
VP: E F Halloran
Sec: E R Menary
MT JACKSON-GREAT EASTERN MINE, 4 mi N of Gurneville, shaft, Hg
Supt: A G Mowry
150-TON GOULD FURNACE
Supt: H F Larson
Prod: 125-tons

SOUTHERN CALIFORNIA MINERALS CO
3120 S Mission Rd, Los Angeles
Owner: Walter K Skeoch
Gen Mgr: Chas F Joy
Purch Agt: Dan Tash
MINES, Death Valley area, Talc
Supt: Ben Gomez
Asst Supt: Ray Kelley
AIR FLOT MILL, Los Angeles, 150-tons
Supt: Glen Hodges

SOUTHERN CROSS MINE
Box 178, Columbia
Gen Mgr: Charles M Bryan
Owners: Grant, Bryan & Foster
MINE, 14 mi NW of Columbia, adit, Au

SPANISH MINE
100 Palm Drive, San Rafael
Owner: Louis R Moretti
MINE, Nevada Co, open pit, dev, Baryte

SPECIMEN MINE
c/o Joe Costa, Bear Valley
MINE, Mariposa Co, Au, Ag

SPELL & WEBSTER
Box 347, Twentynine Palms
WEBB MINE, San Bern Co, underground, Au, Ag, Pb, idle

STANDARD ROCK CO
1412 E Washington, Stockton
Mgr: W J Nemie
GRAVEL PIT & GOLD PLACER, Nemie Ranch, Oakdale dist

STEINHOFF, HUGH
Box 762, Nevada City
RAINBOW BAR GROUP, Wash dist

STEPHENS, A E
Box 175, El Dorado
INDEPENDENCE MINE, underground, Au

STOCK, HARRY
Seiad Valley
PORTUGUESE MINE, Siskiyou Co, placer, Au

STOCKTON HILL MINE
Box 949, Grass Valley
Operator: Ross W Chamberlain
MINE, underground, Au, dev
Supt: G W Metzger
Foreman: D M Chapman

STREUBEL, G R
Rt 1, Box 238, Oroville
TOLERATION PLACER, 22 mi N of Oroville, Butte Co, dev

SUMMIT HILL MINE
Greenwood
Owners: Boone & Turner
MINE, dev, Au, Ag, Pb
25-TON GRAV MILL

SUNSET CHROME MINE
Forest Hill
Operator: C I. Matthers
MINE, Placer Co, Cr

SUNSHINE GOLD MNG CO
Box 555, Redding
Pres: W D McDuffie
MINE, underground, Au, Ag
Engr: J H Wren
Supt: J J Sullivan
100-TON FLOT MILL
Supt: Morgan Evans

SURCEASE MINING CO
214 30th St, Sacramento
Pres & Gen Mgr: J W Hoefling
Res Mgr: D A Moyer
ATOLIA MINES, 3 mi SE of Randsburg W open pit, placer
Supt: F D Hoefling
GRAV CONC MILL, portable wash pl
Supt: R C Lipold

SWEETSAR, N W
Box 467, Rosamond
GOLDEN QUEEN MINE, Mojave dist

TAPLEY, RALPH & M
Box 358, Columbia
FORD POCKET MINE, Tuolumne Co, Au

TAYLOR, MERLYN
Box 202, Mariposa
T A WOOD PROP, Madera Co, placer, Au

TETIVA, JOE
Comptonville
JOUBERT PLACER Pike dist

TEEKAY MINES, INC
Box 245, Tracy
Pres: S R Knapp
Sec & Gen Mgr: A V Taylor Jr
VP & Engr: C P Knaebel
LADD MINE, Tracy, adit, open pit, MnO_2, 80-tons
GRAV-MAG MILL
Supt: Jess Wilson
Chem: H R Kaiser

TERMINAL TRUCK SERVICE
211 N 16th St, Sacramento
CANYON CR PLACER, Trinity Co, Au

THACKER, CHARLES W
Strawberry Valley
SCALES PLACER, Pike dist

THOMAIN, C F
Sawyers Bar
CROWN PLACER, Siskiyou Co, Au

THOMPSON, W E
Iowa Hill
TWENTY ONE MINE, placer

THURMAN & WRIGHT
235 Montgomery St, San Francisco
Purch Agt: I B Walther
PLACER, Battle Cr, dragline dredge, Au, Ag, Pt
Supt: J N Sobrero

TIGHTNER MINES CO
Rm 309, 58 Sutter St, San Francisco
Pres: R E McCullock
VP: Edwin Oliver
Sec: Carlo S Morgio
Treas: W T Jenkins
RED STAR GROUP, N of Alleghany, shaft, adit, Au, Ag
(Leased to Yellow Jacket Cons Mines)

TODOC & RED MOUNTAIN CHROME MINES, Platina
Pres & Gen Mgr: H T Moore
MINES, Shasta Co, open pit, Cr
Supt: R C Moore

TOTLAND, BROS
Box 341, Leevining
Gen Mgr: G H Totland
BARBARA & BIG NUGGETT MINES, 12 mi NE of Leevining, Au, Ag, Pb

TOTLAND & SCANAVINO
Leevining
GOLDEN FROG MINE, 8 mi W of Conway Summit, vein, idle

TOYE, I R
Mount Bullion
EARLY LODE, E Belt dist

TREBOR CORP
Box 51, Mariposa
STAR EXCELSIOR LODE, Coppero-polis dist

TROSTER, A F
Box 83, Trona
CORONA GROUP, S Park dist, lode

TRULLINGER, RALPH
Alleghany
SEYMOUR DUMP, lode

TULARE COUNTY MINES
Box 361, Lindsay
BIG JIM MINE, W

TUNGSTAR-HANGING VALLEY MINING CO, Rm 705, 6253 Hollywood Bldg, Hollywood 28
Ch of Bd: Gayle Green
Pres: G F Temple
VP: Gen Ralph Cousins
Sec: C A Greene
Treas: R E Ahlport
Gen Mgr: Ira Thomason
TUNGSTAR-HANGING VALLEY & BLACK ROCK MINES, Box 505, Bishop, 22 mi W of Bishop, adit, shrinkage stoping, W
GRAV FLOT MILL, Pine Creek
Prod: 75 tons

TUNGSTONE MINES
Box 567, Bishop
Pres: W A Trout
VP & Gen Mgr: C A Rassmusen
Sec Treas: Clyde Triplett
Gen Supt: Dar Heifer
MINE & MILL, Posey, W
150-TON GRAV CONCENTRATOR

TUOLUMNE GOLD DREDGING
1 Montgomery St, San Francisco
GOLD PLACER, La Grange, idle

TURNER, JOHN
Moccasin Rt, Chinese Camp
LUCKY # 1 & 2 MINES, Tuolumne Co, placer, Au

TWINING LABORATORIES
2527 Fresno St, Fresno
Owner: Fred Twining
FLOT, MAGNETIC SEPARATION prod-scale assaying
Met: Vernon Young

UBEHEBE LEAD MINES, INC
356 S Spring St, Los Angeles 12
Pres: Grant Snyder
VP: E S Alexander
Sec: Allen Rankin
UBEHEBE MINE, Death Valley, vein, open stoping, Pb, Ag, Au
Supt: Henry Hageman

UNDERSTOCK, E N
Box 50, Magalia
WYOMING MINE, Butte Cr dist, lode

UNITED STATES BORAX CO
510 W 6th St, Los Angeles 14
BORAX MINE, Shoshone

UNITED STATES GYPSUM CO
300 W Adams Chicago 6, Ill
(See North Central listing)
OPEN PIT MINE, Midland, Gypsum
Mgr: M C Grisham
OPEN PIT MINE, Plaster City, Gypsum

U S LIME PRODUCTS CORP
1840 E 25th St, Los Angeles 58
Pres: W O Anderson
VP: Kennedy Ellworth
Sec Treas: E B Long
Cons Engr: S L Arnot
SONORA PLANT, Sonora, open pit & shaft, limestone, dolomite
Gen Mgr: W A Stinson
Foreman: Stanley Wynne

U S VANADIUM CO
(See North Eastern listing)
MINE, 17 mi W of Bishop, adit with shrinkage stoping, W, Mo
Gen Mgr: A P Cortelyou
Gen Supt: H L McKinley
Mine Supt: T W Holmes
500-TON FLOT MILL
Supt: L E Sausa

USHER, J W
Sawyers Bar
SECURITY MINE, Siskiyou Co, underground, Au

VALTOM MINING & EXPLORATION CO, 1109 Security Bldg, Long Beach 2
Gen Mgr: E P Dorr
SIDEWINDER MINE, NE of Victorville

VAN GIESEN, ED
Box 884, Auburn
GOLDSBERRY MINE, Placer Co, undgrnd, Au

VICTORY MINERALS, INC
Victorville
Pres: G R Seala
VP: Thomas Knight
Sec Treas: Wm Johnstone
Engr: Douglas Christensen
BLUE NUGGET MINE, 22 mi N of Victorville, shaft, Cu
GREY EAGLE GROUP, Pb, Ag, Lime

VINCENT, A R
Gen Del, Folsom
GEORGE WILSON PROP, Sacramento Co, underground, Au

VIZCAINA & NICHOLS
Big Pine
HOPE & BLACK CANYON MINES, Inyo Co, Ag, Cu, Pb

VOGES, L A
Box 5, Hornbrook
PROVIDENCE MINE, Siskiyou Co, underground, Au

VOLO MINING CO
464 Main St, Placerville
Pres: F V Phillips
SHAW & CLAYTON MINES, El Dorado Co, Au, Ag

WALABU MINING CO
3915 Rosedale Hwy, Bakersfield
Pres: Walter F Buass
CUDDEBACK MINE, near Keene, vein dev by adit, Hg

WALTERS, GEORGE
Downieville,
YORK MINE, Downieville dist

WARNER, C D & SON, INC
1027 Yosemite Blvd, Modesto
GRAVEL PIT & PLACER, Waterford dist, Au

WARNKEN, LOUIS JR
Darwin
GOLD BOTTOM MINE, Inyo Co, lode, tailings, Ag, Pb

WATERMAN, J L
Rt 2, Box 2024, Elk Grove
MOKELUMNE GRAVEL PIT, San Joaquin Co, placer, Au

WATTS, ALVIN J
Iowa Hill
Strawberry mine, Placer Co, Au

WAUGHTEL, ROY V
Box 411, Yermo
ALVORD & LITTLE MIKE MINES, San Bernardino Co, underground, Au, Ag

WAUKASHAW MINE
Graniteville Star Rt, Nevada City
Partners: G F & F M Mellott
MINE, open pit & placer, Au, Ag
Prod: 150 yds

WAXNER, WALTER E
Gen Del, Nevada City
CASCIA RANCH PLACER, Grass Valley

WAYNE, WILLIAM S
Box 2, Fawnskin
GLACIER MINE, San Bern Co, Au

WEAVER, A C
Sonora
TIP TOP MINE, Tuolumne Co, Au

WEAVER, GEORGE
Forbestown
ALICE CADY PLACER, Yuba Co, Au

WEAVER, RUTH
Jamestown
WEAVER RANCH PLACER, Mother lode dist

WEGMANN, BERT
Box 195, Randsberg
BIG DYKE & HERCULES MINES, Kern Co, Au, Ag
30-TON MILL

WELDON, HENRY
Weldon
WHITNEY MINE, Kern Co, undgrnd, Au, Ag

WENTWORTH, MANN & SMITH
111 Canal St, Placerville
SUGAR LOAF MINE, El Dorado, underground, Au

WESTERN ANTIMONY, INC
519 California St, San Francisco
Pres: Wm C Crittendon

WESTERN COPPER CO
Box 178, Talorsville
Gen Mgr: R F Wilson
IRON DYKE, BERDSLEY MINES, Au Ag, Cu, 100 tons

WESTERN GOLD, INC
942 Russ Bldg, San Francisco 4
Pres: W H Taylor
Gen Mgr: T H Taylor
RELIEF HILL MINE, Nevada Co, hydraulic, Au

WESTERN TALC CO
1901 E Slauson Ave, Los Angeles
Pres & Gen Mgr: F H Savell
Sec Treas: J Y Elwood
WESTERN TALC MINE, 9 mi SE of Tecopa, underground, Talc

WHISKEY HILL MINE
Schilling
MINE, Shasta Co, underground, Au

WHITE & RAY
Box 54, Orleans
PEARCH MINE, Humboldt Co, placer

WHITE, WALTER
Box 1174, Auburn
GLENN PLACER, Placer Co, Au

WIECE, FRANK & WESLYN
Darwin
SILVER SPOON MINE, Inyo Co, Ag, Pb Zn

WILLIAMS BROS
Rt 1, Box 1061-E, Modesto
MINE, Mariposa Co, undgrnd, Au

WILLIAMS, FRED
Rt 1, Box 591C, Fresno
WISHON & WATSON CLAIMS, Friant dist, Au

WILSON, FRED D
Happy Camp
PROTECTION PLACER, Siskiyou Co, Au

WILSON, W E
Foresthill
PARAGON MINE, Placer Co, Au, Ag

WIND WHEEL MINE
Box 151, Columbia
Owner: R O Greeves
Underground, Au, Ag
GRAV MILL

WINSHIP, K D ESTATE
c/o T T Taylor, 350 Post St, San Francisco 8
UNION FLAT PLACER, E Belt dist

WINTER, WILLIAM & SON
429 San Anselmo
RAINBOW MINE, Siskiyou Co

WISER-HUGHES DEV CO
Taylorsville
LUCKYS MINE, 15 mi NE of Taylorsville, underground, Au

WOLDEN, ESTEN
Box 1103, Nevada City
KANAKA CR PLACER, Sierra Co, Au

WOLFE, W C
Rt 1, Box 1710, Colfax
OAK HILL PLACER, You Bet dist

WOODRUFF, WILLIAM W
Rt 2, Box 95-A, Perris
CENTENIAL MINE, Riverside Co, idle, underground, Au, Ag

WRIGHT J F
6023 Wright Ave, Bakersfield
GOLDEN QUEEN LODE, Whipple Mt dist

WYLIE, MR & MRS V L
Georgetown
GOLD COIN MINE, El Dorado Co, underground, Au

WYLIE, A K
Alturas
LOST CABIN LODE, Winters dist

YELLOW JACKET CONS GOLD MINES, 120 Chester Ave, Bakersfield
Pres: Clifford Dickhut
Sec: James Ebert
YELLOW JACKET GROUP, OSCEOLO GROUP, TIGHTNER MINE & TENN GRAVEL MINES, Alleghany, Au, Ag
Supt: C J Ayres

YOLO DEVELOPMENT CO
1900 V St, Sacramento
Pres: E G Bickell
BLUE POINT MINE, Smartville, open pit, placer, Au, dev

YUBA CONS GOLD FIELDS
351 California St, San Francisco
Pres: S M Bolster
VP & Gen Mgr: F C Van Deinse
Sec Traes: O W Smith
PLACER MINES near Marysville, Au
5 dredges on Yuba River, 1 dredge on Feather River, 1 dredge on Folsom R, operated under name of Capital Dredging Co
Gen Field Mgr: C V Deaver

YUKOHL TUNGSTEN MNG CO
Box 39, Dunlap
Pres & Gen Mgr: R W Burge
TRAWEEK MINE, W, idle
Mgr: S H Strickland
35-TON MILL

COLORADO

AJAX BASE METALS, INC
210 La Arcada Bldg, Santa Barbara
Pres: L E Dresback
Sec: Don Dalzell
MORO AJAX MINE, 8 mi S of Lake City vein, shrinkage stoping, Pb, Au, Zn, Cu
Gen Mgr: V B Bjorkman

AJAX MINING & OIL CO
Box 1075, Grand Junction
Pres & Gen Mgr: C A Dye
VP: Al Martin
Sec Treas: E K Stephen
LUCKY DAY & AJAX MINES, 6 mi SW of Gateway, adit, open stoping, U

ALEXANDER FILM CO, Alexite Engineering Division, Colorado Springs
Pres & Gen Mgr: J D Alexander
VP: D M Alexander
ALEXITE MINE, Rosita, open pit, perlite
Supt: Vernon Cheever
Purch Agt: Frank Pierce
100-TON MILL, Florence
Supt: R Ebeling
Engr: Jack Green
Met: Clarion Taylor

ALLIED CHEMICAL & DYE CORP, General Chemical Division
(See Northeastern listing)
Box 228, Boulder
Dir of Mng: O H Dickson
Gen Supt: W J Trepp
JAMESTOWN MINES, Saluda, underground, Fluorspar
Supt: A W McGowen
Foreman: Wm Popst
FLOT MILL, Valmont
Foreman: T S Hinshaw
Met: G H Musson

ALMA SYNDICATE
Denver
MINERAL PARK CLAIMS, Fairplay, Park Co,
Operator: George Spencer

AMERICAN SMELTING & REFINING CO (See North Eastern listing)
607 First Nat'l Bank Bldg, Denver 2
Mgr: J Paul Harrison
ARKANSAS VALLEY PL, Box 973, Leadville, Pb
Supt: Leo Hannebach
Asst Supt: Thomas Fahey
Mets: M D Rood, Harold Muench & Ward Gibson
Mast Mech: John Clark
Ch Clk: Edward J Kelly
Safety Engr: Frank Stevens
Fl Engr: R L Armbruster
Ch Assay: R J Elliott
Ch Chem: Max Kasten

GOLBE PL, Denver, Cd
Supt: W L Miles
Asst Supt: Max Coats
Met: C F Baker, Jr
Ch Chem: Earl L Rau
Safety Insp: J J Ryan

AMERICAN ZINC, LEAD & SMELTING CO, Box 558, Ouray
CALEDONIAN MINE, 9 mi N of Silverton, adit, shrinkage stoping, Pb, Zn, Cu Ag
MT KING KOEHLER MINE, Au, Ag, Cu, Pb, Zn
Foreman: Claude Robinson
Mast Mech: John Fox
200-TON FLOT MILL, custom
Supt: Wm Klein

ANACONDA LEAD & SILVER CO
1717 E Colfax Ave, Denver
Ch of Bd: Gen Lloyd D Ross
Pres: Ralph G Orton
Exec VP: Howard P Waite
EL PASO MINE, Cripple Cr, Au

B & B MINES, INC
c/o Richard Downing, 824 Equitable Bldg, Denver 2
WELLINGTON GROUP, McKINLEY MINES, Breckenridge, Au, Ag, Cu, Pb, Zn
(Leased to W L Davenport)

BACHELOR DEVELOPMENT CO
Ouray
Mgr: J R Sonza
BACHELOR MINE, Ouray Co

BARLOW & BEARD
Dove Creek
RADIUM "8" MINE, San Miguel Co, U

BARNES MINING CO
Box 161, Silverton
Pres & Gen Mgr: R C Barnes
VALLEY FORGE GROUP, 2 mi NE of Silverton, adit, Au, Ag, Cu, Pb, Zn
Prod: 20 tons

BELISLE & REED
Ophir
NEW DOMINION MINE, San Miguel Co

BELL MINING CO
627 3rd Ave, Salt Lake City, Utah
Pres: A J May
VP: A E Perkins
Sec & Gen Mgr: Hugh C Lewis
BELL MINE, 1 mi S of Montezuma, underground, Pb, Zn, Cu, Au, Ag, dev

BERYLLIUM MINING CO, INC
920 2nd Ave, Seattle 4, Wash
Pres: J R Wemlinger
VP: A L Schuler
Gen Mgr: C A Wemlinger
OHIO CITY MINE, 22 mi from Gunnison, Box 276, Gunnison, open pit, Beryl, Mica Feldspar, Tantalite, Columbite
Foreman: Rosco Riddle

BESSIE G MINE
147 E 9th St, Durango
Operators: Bert Thompson & Assoc
MINE, Hesperus, Au, Ag, idle

BETTY JANE MINING CO
Montezuma
Mgr: F S Chillson
Owner: J A Alley
WAUNEITA MINE, Summit Co, idle

BIG FOUR
Kremmling, Zn, Pb, Au, Ag
Owner: Frances McDaniel

BONITA MINING & DEV CO
Box 186, Silverton
Pres & Gen Mgr: H P Ehrlinger
VP: F C Brightly
LEAD CARBONATE MINE, 11 mi NE of Silverton, underground, Pb, Zn, Cu, Au, Ag
FLOT MILL, 50-tons
MINNEHAHA & PRIDE OF BONITA, 11 mi N of Silverton, underground, Pb, Ag, Zn
EMMA-OREGON-GALENA GROUP, San Juan Co, dev, ZnPbAg

BREWSTER MINE
Box 2136, Denver
Pres: F L Ross
Mgr: George Fauri
BREWSTER MINE, Ophir, underground, Au, Ag, dev

BROOKS-YOUNG MNG CO
Box 63, Idaho Springs
Mgr: Herbert T Young
ALLEN EMORY MINE, Montezuma, adit, Pb, Zn, Ag
Supt: F W Brooks
Foreman: E R Johnson

BUCKSKIN JOE MINES, LTD
Alma
Gen Mgr: C W Jordan
PHILLIPS MINE, Au, Ag, Cu, Pb, Zn, Fe
Foreman: Joe Thibodeau
Prod: 200-tons monthly

CAHILL, LESTER
Salida
CORA MINE, Saguache Co
Owner: Mrs Harvey Gillette

CALLAHAN ZINC-LEAD CO
100 Park Ave, New York 17, N Y
Pres: J T Hall
VP: H J Hull
Sec: Alfred Ogden
Treas: E A Salo
VP Chg Oper: R F Mahoney
AKRON MINE, Sargents, Pb, Zn
Supt: J E Dunn
Asst Supt: R J Flynn
Foreman: Ora Statler
Engr: Ralph Stitzer
75-TON FLOT MILL

CAMP BIRD LTD
49 Moorgate, London EC 2, England
70 Pine St, New York, N Y
Pres: F C Heley
CAMP BIRD MINE, Ouray, Au, Ag, Cu, Pb, Zn
Supt: Keith Johnston
(Under lease to King Lease, Inc)
U S Management by Goldfields American Dev Co, Ltd.

CANYON GOLD, INC
Cripple Creek, 209 E Bennett Ave
Pres: Troy E Wade
VP: William A Kyner
Sec Treas: Jesse Simmons
RUBIE & GRACE GREENWOOD MINE, 2 mi from Cripple Cr, Au, 20 tons

CENTRAL MNG & DEV CORP
Central City
Pres: W C Schaus
VP & Mgr: R M Schaus
Purch Agt: J M Haney
NATIONAL, MEEKER SUCCESS, IVANHOE & BARNES, STARK CO MINES, Etc, underground, Au, Ag, Cu, Pb, Zn, idle
Supt: Joe Thomas
Foremen: Marvin Olson

CHAMPION MINES CO
941 Monroe St, Denver 8
Pres: Jesse Simmons
Sec: J J Simmons
MORNING STAR & LAST CHANCE, owns JERRY JOHNSON, WPH & FOREST QUEEN MINES, Leasing, Cripple Cr, underground, Au
Foreman: F W Gunn

CLARK DEV CO
Kokomo
SEDALIA & FORTUNE CLAIMS, Pb, Zn
Mgr: Paul Clark

CLIMAX MOLYBDENUM CO
(See North Eastern listing)
Midland Savings Blg, Denver
VP Chg Mining: W J Coulter
Purch Agt: Albert Staziker
Cons Engr: F S McNicholas
MINE, Climax, Mo, W, Sn, Fe
Gen Supt: C J Abrams
Asst Gen Supt: Frank Coolbaugh
Geol: Fred Howell
Mine Supt: Willis Wamsley
Asst Supt: John Petty
Foreman: Edwin Eisenach
Engr: M S Walker
17,000-TON GRAV FLOT MILL
Supt: Max Dessau
Asst Supt: Frank Windolph

CLIMAX URANIUM CO
Grand Junction
Pres: Carroll L Wilson
VP: Marvin L Kay
Asst Treas: V O Jailings
Purch Agt: Ray Gough
Underground, U V
Supt: J E Weston
Asst Supt: Robert Pruess
Engr: R S White
Mill Supt: L G Peterson

COBB & WELDON
401 Pine St, Boulder
FRANKLIN MINE, 10 Mi W of Boulder, underground, Au
Foreman: C R Jones
MINES, Boulder Tungsten dist, W
Supt: W S Cobb
25-TON GRAV MILL, Nederland

COLORADO FUEL & IRON CORP
Continental Oil Bldg, Denver
Pres: C W Meyers
Exec VP: A F Franz
VP Chg Oper: J J Martin
Dir of Purch: L C Rose
WAGON WHEEL GAP MINE, Fluorspar
Mgr Mng Dept: G H Rupp
Gen Supt: R L Hair
Ch Mng Engr: W J Schenier

COLORADO GOLD KING, INC
Box 186, Silverton
GOLD KING & GOLDEN MONARCH MINES, underground, Au, Ag, Cu, Pb, Zn
Supt: L M Mertz
Asst Supt: C W Fleming
Engr: John Briggs
Foreman: John Jenkins
50-TON FLOT MILL
Supt: Geo Voilleque
Asst Supt: H P Ehrlinger III

COLORADO STANDARD LEAD & ZINC MINES, INC
Pres: J B Kassebaun
VP & Man Dir: R R Wilson
UTE, ULE, HIDDEN TREAS, CALIF LIGHTNING STRIKE MINES
100-TON MILL

COLUMBINE PLACER MINES
Rm 418, 1108 15th St, Denver 2
Pres: Samuel Johnson
Sec: D F Johnson
RED BUCK MINE, near Tin City, Au, Ag
GRAV MILL, under dev

CONS CARIBOU SILVER MINES
1406 Pearl St, Boulder
Pres: D M Nelson
VP: R J Reynolds, Jr
Gen Mgr: Matthew Ollsen
MINE, 20 mi W of Boulder, underground, Ag, Pb, Au, U
Supt: Ed Rice
Engr: A Bird
150-TON FLOT MILL
Supt: Paul Robinson
Assay: Edward Hill

CONS FELDSPAR CORP
Parkdale
MINE, Parkdale, Feldspar
Supt: A E Boone
800-TON FLOT MILL
Foremen: N Quick, G A Chilson, C Clift
Met: E Kemp
Chem: C B Harris

CORDILLERA CORP
Box 61, Fairplay
VP Chg Oper: N H Dunn
Owner: C J Merline
LIKG GROUP MINES, Summit & Park counties

COSTELLO LEASE
Villa Grove, Bonanza Rt
Operator: W J Costello
RAWLEY MINE, Ag, Cu, Pb, Zn
Prod: 50 tons monthly

CRESSON CONS GOLD MINING & MILLING CO, Box 127, Cripple Cr
Pres: M E Shoup
VP & Gen Mgr: Max W Bowen
Gen Supt: C H Carlton
CRESSON MINE, underground, Au
Supt: Welsley Moulton
Engr: Guy Rorabaugh

CRESTED BUTTE MNG & MLG
Crested Butte
Mgr: H J Stevens
DAISY, CRESTED BUTTE, OH BE JOYFUL & LITTLE DAILY MINES, Gunnison Co

CRIPPLE CREEK MNG & MLG
Box 247, Cripple Creek
Gen Mgr: Arthur J Hogan
GOLD KING MINE, E of Cripple Creek, underground, Au

DANIEL, GEORGE S
625 F St, Salida
STONEWALL MINE, Chafee Co

DIAMOND MT MINES, INC
Idaho Springs
Mgr: Wm Wright
KITTY CLYDE MINE, Clear Cr Co

DULANEY MINING CO
312 First Nat'l Bank Bldg, Grand Junction
Pres & Gen Mgr: R O Dulaney
VPs: R O Dulaney, Jr; C H Dulaney
Sec Treas: T E Potts
Purch Agt: Mrs Elvira Potts
RADIUM 7, TENDERFOOT MESA, MICHAEL BRAY & BARLOW CR GROUPS, 31 mi N of Dove Creek, shaft, adit, U, V, 200 tons
Supt: L P Gaggini
Asst Supt: Verne E Hooker

E & H LEASING CO
Meeker
BURRELL #1 & Last Day Mines, Montrose Co, U

EAST RIDGE CO
633 S Shatto Pl, Los Angeles
Pres: C E Byrne
VP: Fred Moldenhauer
ANDRUS MINE, 14 mi NE of Silvertown, underground, ZnPb, Cu, Ag, Au
Geol: F H Frederick
Supt: A E Dirrim

EDWARDS & ASSOC
117 Osage Ave, Manitou Springs
Pres & Gen Mgr: Ed A Edwards
ASTEC GROUP MINE, Dolores Co underground, Ag, Pb, Zn
Assay: C H Tuller
Supt: Harry Barner
(Under lease from George E Hicks, owner, Rice)

EMPERIUS MINING CO
Emperius Bldg, Creede
Pres: T B Poxon
Treas: H B Hayden
Gen Mgr: E W Nelson
Asst Gen Mgr: Warren Caton
Ore Purch: W I Leary
COMMODORE, AMETHYST, EQUINOX, ROBINSON & HAPPY THOUGHT MINES
3 mi S of Creede, Pb, Zn, Ag, Au, Cu
Supt: I D Crawford
120-TON FLOT MILL, Creede

ERNEST, LLOYD & HAROLD
Dove Creek
RADIUM # 6 MINE, San Miguel Co, U

EVANS BASIN MNG CO
Crested Butte
Mgr: Joe Rozman
CHAUTAUQUA MINE, Gunnison Co

FEDERAL MNG & MLG CO
Russell Gulch
Pres & Gen Mgr: J N Thouvenall
MINE, Gilpin Co, underground, Au, Ag, Cu, Pb, U
75-TON FLOT MILL
Supt: Henry Rees
Foreman: J T Powers Jr

FISHER MINING CO
Dillon
Pres: A H Fisher
Gen Mgr: A L Fisher
GOLDEN SLIPPER MINE, underground, Au, Ag, Cu, Pt
Supt: Frank Baker

FLORADO MINING CO
702 U S Nat'l Bank Bldg, Denver 2
Pres: F R Wolfle
Sec Treas: E H Wolfle
MINE, Montezuma, Au, Ag, Pb, Zn
100-TON FLOT MILL
Supt: Earl Sullivan

FOSTER, RALPH
1217 Colorado Ave, Grand Junction
CALAMITY MINES, Calamity Area, U

FOURSOME MINING CO
Silverton
Gen Mgr: Wm Erickson
COLUMBUS MINE, Au, Ag, Cu, Pb, Zn
Idle

FRONT RANGE MINES, INC
Continental Oil Bldg, Denver
Pres: John Deerksen
VP & Gen Mgr: George H Teal
MATTIE MINE, Clear Cr Co, Pb, Au, Ag
MELVINA MINE, Boulder Co, Au
STRONG & MARY CASHER MINES, Teller Co, Au
KING SOLOMON GROUP, under dev
CLEAR CREEK MILL, Dumont, flot
Prod: 200 tons

GALENA QUEEN LEASING CO
c/o Glenn Gardner, Silverton
MINE, San Juan Co

GARFIELD MINE
Box 209, Salida
Gen Mgr: W E Burleson
Contractor: Carl McMullen
GARFIELD MINE, 20 mi W of Salida, underground, Pb, Au, Ag, idle

GATEWAY MNG & DEV CO
875 Glenwood Ave, Grand Junction
Pres & Gen Mgr: Edw Gilmore
VP: R C Hartman
Sec: John Thornton
Treas: Herman Tetzloff
Engr: Jake Lewis
CORVUSITE MINE, 11 mi W of Gateway, adit, U, V, 10 tons

GENERAL GOLD CORP
Twin Lakes
Pres: W H Haines
Gen Mgr: A E Hall
Sec Treas: O J Boucher
MT ELBERT PLACERS, Leadville, Au, Ag, dragline dredge, idle
Supt: Robert Berke

GILES, LEROY & CO
Idaho Springs
DIXIE MINE, Clear Creek Co

GLOBE HILL MINING CO
334 Independence Bldg, Colorado Springs
Pres & Gen Mgr: A S Konselman
VP: Melvin Brugger
Sec Treas: G F Grote
PROPER & CHICAGO MINES, E of Cripple Creek, underground dev

GOLD MINES CONS, INC
Georgetown
Pres & Gen Mgr: K M Oblander
Treas: J R Havill
Sec: R E Fauls
DUNDERBERG-TERRIBLE MINE, Silver Plume
JOE DANDY MINE, Cripple Creek, Au

GOLDEN CYCLE CORP
Box 68, Carlton Bldg, Colorado Springs
Pres: M E Shoup
VP & Gen Mgr: Max Bowen
Purch Agt: Howard Stone
AJAX MINE, Cripple Creek, Au
Supt: Charles Carlton
1000-TON FLOT & CYANIDE MILL
Supt: Howard Kell

GRAMLICH MINERALS INC
Paradox
Pres & Gen Mgr: J W Gramlich, Sr
VP & Supt: J W Gramlich, Jr
Sec Treas: P J Gramlich
LION CR CLAIMS, SW of Paradox, U, V
Prod: 10 tons

GREAT EASTERN MNG CO
Silverton
Pres: W L Chase
Dir: Allen T Chase
Ch of Bd: Art Linkletter
Purch Agt: Carl Laeson
GREAT EASTERN BURNS GULCH, SIOUX CITY, GREEN MT, & PRIDE OF THE WEST MINES, underground, Au, Ag, Cu, Pb, Zn
(Leased by Flemming, Slade & Knolls)
100-TON FLOT MILL, Howardsville

GREGORY & PACKARD PLACER
Blackhawk
Owner: L D Clark
MINE, Gilpin Co, Au, idle

GUM TREE MNG SYNDICATE
Idaho Springs
MINE, Clear Creek Co

HENNA MINES, INC
Box 483, Boulder
Pres: Leo Delorme
Sec & Gen Mgr: W E Brewster
CASH, BELLEVUE, WHO DO & COLUMBUS MINES, 10 mi NW of Boulder, underground, Au, Ag, Pb

HENNING, KETTLE & WALKER
Westcliffe
DEFENDER MINE, undgrnd, Ag, Pb, Zn
(Leased by Ed Stacy)

HETZER MINES, INC
Boulder
Pres: Elmer Hetzer
MINES, Boulder Co, W, leased:
HOOSIER MINE, Prime & Johnson
PROSPECT TUNNEL, Jones & Funk
SPENCER TUNNEL, Hay & R Flarty
LAST CHANCE MINE, Prime, Johnson & McKenzie
HEINE LEASE, Hennings & Smith

HIGHLAND MARY MINES, INC
900 Land Bank Bldg, Kansas City, Mo
Pres: A R Jones
Sec Treas: C W Trapp
Mgr: F A Brinker
Gen Supt: R M Andreatta
MINE 9 mi E of Silverton, Pb, Ag, Au, Cu
Mine Foreman: Wm Loftus

HOLDEMAN, E S
Uravan
MILL #1 R A M & RAMBLER of the CLUB GROUP 2 mi S of Uravan, underground

IDA BELLE MINE
Breckenridge, Summit Co
Sub-lessee: Wm. K Kirschmer

IDARADO MINING CO
14 Wall St, New York City, N Y
(see Newmont Mng Corp, Calif)
Pres: Oscar H Johnson
Gen Mgr: Fred Wise
Gen Supt: Robt Cocker
MINES located on Red Mountain, 11 mi SW of Ouray, Box D, Ouray, Cu, Pb, Zn
Mine Foreman: R W Leber
Mill Supt: R W Unger
Ch Engr: J S Wise
Mast Mech & Ch Elect: E H Tucker
500-TON FLOT MILL

ISABELLA MINES, INC
Colorado Springs, Colo
Pres: Wm A Kyner
VP: Franklin Ferguson
Sec Treas & Gen Mgr: J H Keener
ISABELLA MINE, Cripple Creek
Shaft under dev

JACK PINE MINING CO
% D V Watrous, Denver
D C Mitchell, oper., Idaho Springs, Clear Creek Co

JACK POT LODES # 1-2-3
Ouray, Au, Ag, Cu, Pb, Zn
Owner & Operator: F O Richardson
Under dev

JEFFREY & ULIBARRI
Montezuma
QUAIL, WATERLOO, NEW YORK & SILVER KING MINES, Summit Co

JESSIE MINE
Summit Co, Breckenridge dist,
Oper: S P True

JOE DANDY MINING CO
334 Independence Bldg, Colorado Springs
Pres: Hildreth Frost
VP: Vernon Mitchell
Gen Mgr & Treas: A S Konselman
Sec: C E Yoes
Supt: Harry Allen
JOE DANDY, C O D, COMMONWEALTH, HILLSIDE, CLIMAX, VICTORY & SEATTLE MINES, Mines located 3-5 mi E of Cripple Creek, underground, open-pit, Au

JONES & NYLENE MINING CO
Box 592, Leadville
Partners: R L Jones, H O Nylene
GARIBALDI LEASE MINE, 2 mi E of Leadville, Pb, Zn, Au, Ag
Vein mined by adit with shrinkage and open stoping
40 tons daily
SUMMITVILLE MINES, Summitville, 45 mi W of Monte Vista
vein mined by adit with shrinkage stoping
SUMMITVILLE MILL, grav-flot
75 tons daily

JOSIE K FOLSOM MINING & MILLING CO
4280A Holly Ave, St Louis 15, Mo
Pres: Dr. C R Curran
Gen Mgr: Fred W Kublin
Dir: Paul Becker
Dir: Oscar F Huegel
JOSIE K FOLSOM MINE, Saguache Co, P O Address, Del Norte, Au, Ag
Assy: George G Hayes, Denver
under dev

KENNEBEC MINING CO
704 U S National BankBldg, Denver
(Lessee) M J Krolicki
Gen Mgr: A E Moynahan
Supt: R L Robeson
ORPHAN BOY, Park Co

KING LEASE, INC
Ouray
Pres: Joseph King
Exec VP & Gen Mgr: H S Worchester
Sec: Franklin A Bell
Treas: Kenneth Moore
Asst Sec: James K Groves
Purch Agt: J E Danielson
CAMP BIRD MINE, 6 mi SW of Ouray
Pb, Zn, Cu, Ag, Au
vein, adit with shrinkage stoping
Supt: L D Barry
Ass't Supt: F A Bell
Foreman: F M McConochie
Engr: T B Hedlund
CAMP BIRD MILL, flot
Prod: 120-240 tons
Supt: Gus Cossairt

KINGS TURQUOISE CO
Manassa
Pres: Charles G King
Mgr & Mine Foreman: Horace E King
TURQUOISE MINE at Manassa

KRONSBEIN, ROBERT F
Norwood
MINE in San Miguel Co, U

LAMBERTSON, JOHN
Gunnison
Co-owner & Mine Engr: Karl Lambertson
STAR MINE GROUP, 55 mi N of Gunnison, underground, Pb, Ag
300 tons crude ore prod yearly
DOCTOR MINE, 27 mi N of Gunnison, underground, Zn
Idle

LEADVILLE LEAD CORP
508 Kittredge Bldg, Denver
Treas: Tom E McKay
Sec: Clio L Kern
LAST CHANCE MINE, Park Co, idle

LITTLE ALICE LEASE
Leadville
LITTLE ALICE MINE, Lake Co
(Leased to Murray Bros)

LOMBARD MINES, INC
Idaho Springs
Pres & Gen Mgr: Oscar L Stutenroth
VP: M A Isern
LOMBARD MINE, 11 mi NW of Idaho Springs, Au, Pb, Ag, CuZn, idle
100-TON FLOT MILL

LONDON EXT MINING CO
704 U S Nat'l Bank Bldg, Denver 2
Pres: F C Bishop
Gen Mgr: H C Bishop
(See Nev listing)

LU EV MINING CO
Idaho Springs
Partners: J G McGrath, Joe Thomas
HOPE, POWERS & IROQUOIS MINES, Gilpin Co, Au, Ag, Cu
FLOT MILL

LUPTON MINING CO
Box 498, Georgetown
Pres: E P Lupton
Gen Mgr: J C Lupton
Sec & Purch Agt: W E Vernon
Mgr: C E Fetterhoff
GRIZZLY, BASKERVILLE & MOLINE SILVER MINES, Silver Plume
GEORGETOWN CH & BOSTON GROUP
Au, Ag, Cu, Pb, Zn, idle
Foreman: K C Eisner
50-TON FLOT MILL
Supt: A W Johnson

M & S INC
Salida
Pres: J W Magnuson
Gen Mgr: R H Magnuson
SPIKEBUCK MINE, & SNOWDRIFT MINE, open pit, Feldspar

MAMMOUTH MNG & DEV
Box 525, Grand Junction
MAMMOUTH & FOUNTAIN OF YOUTH MINES, Mesa Co, U

MARY MURPHY GOLD MNG CO
Box 209, Salida
Gen Mgr: W E Burleson
MINE, 4 mi SW of St Elmo, undgrnd
Foreman: Henry Carey

MAY DAY MINING CO
Box 581, Silverton
Pres: A G Tilton
Mgr: Ennis Cole
MAY DAY MINE, 3 mi NE of Silverton, adit, Zn, Pb, Ag, Cu, Au

McCRISTY & SWERDFEGER
Boulder
OPHIR MINE, underground, W dev

MENDOTA FROSTBURG MNG CO
c/o Harvey L Tedrow, Denver
Mgr: Andrew C Holmes
MENDOTA GROUP Clear Cr Co

MIDNIGHT MINING CO
Aspen
Pres & Gen Mgr: F J Willoughby
VP: F T Willoughby
Sec: F M Willoughby
MIDNIGHT MINE, 7 mi S of Aspen, shaft, adit, Ag, Pb, Zn
Foreman: Theodore Sandstrom
MILL, Flot, 70 tons

MINE EQUIPMENT CO
Box 2506, Boise, Idaho
Owner: Cole Godsey
JENSEN TUNNEL & WIDOW WOMAN MINES, Au, Ag, Pb, Zn
GRAV FLOT MILL, bucket dredge

MINERALS ENGINEERING CO
801 4th Ave, Grand Junction
Pres: Blair Burwell
VP & Gen Mgr: R G Sullivan
Sec: A F Boyd
Treas: W C Haldane

MOHAWK MINES
c/o Walter Enyeart, Box 154, Breckenridge
Operators: Enyeart & Taylor
MOHAWK & RADICAL MINES, Summit Co

MONO DIAMOND JOE MINES
Idaho Springs
Mgr: Arthur Portenier
MINE, Clear Creek Co, idle

MONTANA MNG & DEV CO
Idaho Springs
Pres: Maynard Sinton
Mgr & Purch Agt: James Anderson
LAMARTINE MINE, Clear Creek Co, adit, Au, Pb, Zn
LAMARTINE MILL
Supt: G H Anderson

MORRILI, J W
Uravan
HENRY CLAY #2, Montrose Co, U

NABOB DEVELOPMENT CO
814 Majestic Bldg, Denver
Pres: C R Froman
VP: G F Crites
Treas: C L Morron
Gen Mgr: Pearl Hubbard
NABOB MINE, 3 mi S of Lawson, underground, Ag, Pb, Au, Cu
Supt: G W Crites
Met & Assay: Charles Parker

NEESHAM & KARO
Nucla
Gen Mgr: Glenn D Neesham
SPHINX MINE, 12 mi S of Uravan, underground, U
Foreman: Robert Ebbs

NEVADA MINES CO
Box 1102, Bonanza
Pres: Walter Timney
Gen Mgr: J G O'Brien
CORA MINE, Au, Ag, Cu, Pb, Zn
SMELTER
Foreman: Curtis Quinn
Assay: E E Smith

NEW JERSEY ZINC CO
160 Front St, New York 38, N Y
Pres: R L McCann
Gen Purch Agt: W J Lee
Mgr of Mines: S S Goodwin
EMPIRE ZINC CO, Gilman
EAGLE MINE, underground, Pb, Zn
Gen Supt: F J Maloit
Supt: W L Jude
600-TON FLOT MILL

NEW MONARCH LEASE
Box 939, Leadville
NEW MONARCH GROUP, Stampton, underground, Au, Ag, Cu, Pb, Zn
25-TON GRAV PILOT MILL
Prod: 300 tons monthly

OLD HUNDRED GOLD MNG CO
Box 448, Silverton
Pres: C H Kimball
VP: P W Neuenschwander
Gen Mgr: B F Webster Jr
Gen Supt: W G Sandell
GARY OWEN MINE, 6 mi NE of Silverton, adit, Pb, Zn, Ag, Cu, Au
Foreman: Thomas Burgess
120-TON FLOT MILL, Cunningham Gulch
Supt: R A Crawford

OSCEOLA MNG & MLG CORP
Silverton
Pres: L C Shirk
Sec: A B Crosby
NEW GREEN MT MINE, San Juan Co
LACKAWANA MILL, idle
Supt: C L Larson

OZARK-MAHONING CO
Box 449, Tulsa 1, Okla
Pres: Park Kelley
Purch Agt: J L Cadden
Mgr: Mike Cloonan
FLUORSPAR MINES, Jamestown
NORTHGATE MINE, underground, dev
CONCENTRATING PL, Jamestown
Supt: E G Ovitz

P M LEASERS
Box 176, Empire
Mgr: C B Myers
GOLD FISSURE GROUP, Clear Creek Co, idle

PARK CITY CONS MINES CO
310 Kearns Bldg, Salt Lake City, Utah
Gen Mgr: Nolan Probst, Gunnison
KEYSTONE MINE, Crested Butte, 29 mi N of Gunnison, underground, dev
Zn, Pb, Cu, Ag

PAYMASTER MINES
Breckenridge
Operator: S P True
MINE, Summit Co, Montezuma dist

PURPLE TOP MINING CO
Glenwood Springs
Pres & Gen Mgr: I A Baillie
VP: Les Baillie
HUMMER #1, 15 mi NE of Leadville, underground, idle, Pb, Ag, Zn
Geol: George Garry
PURPLE TOP MINE, 14 mi NE of Leadville, undgrnd, Pb, Ag, Zn
Supt: Leslie Baillie

QUARTZ HILL METALS DEV
Russell Gulch, Gilpin Co
Owner & Gen Mgr: J N Thouvenell
Met & Geol: R R Hinckley
DELMONICO, QUARTZ HILL & FEDERAL CLAIMS, Au, Pb, Cu, Ag
FLOT MILL, 75 tons

REALTY COMPANY
Box 155, Central City
Pres: R E Harvey
VP: R A Bennett
Sec Treas: Chandler Weaver
CALHOUN GROUP, WOODS, Gilpin Co, Au, Ag, Cu, U, dev
Mgr: Lowell A Griffith

RESURRECTION MINING CO
Box 936, Leadville
Pres: Fred Searls, Jr
Gen Mgr: Fred Wise
Asst Gen Mgr: B B Greenlee
Ch Engr: Robert Jenny
Gen Fore: Elzie Ray
Mech Engr: W R Doyle
Mast Mech: G F Ducotey
Ch Elec: Norman Schroeder
Shop Fore: Loren Anderson
Ch Clk: R F Bochatey
Supply Boss: Edward Hasty
Warehouseman: Glenn Peterson
RESURRECTION MINE, Leadville, vein, shaft & YAK tunnel, Zn, Pb, Au, Ag
RES Mine Fore: C N Stout
YAK Mine Fore: John Poderzay
Engr: Robert Kendall
600-TON FLOT MILL, Leadville
Supt: K L Tatman
Fore: W B Meldrum
Ch Chem: J B Saunders

RICO ARGENTINE MNG CO
Rico
Pres & Gen Mgr: S B Hinckley
VP: J C Johnson
Sec Treas: W G Seley
Purch Agt: J F Koenig
ARGENTINE, SILVER SWAN & MT SPRINGS MINES, Near Rico, shaft, adit, Pb, Zn, Ag, Au, Cu
Supt: C W Gustafson
140-TON FLOT MILL
Supt: C W Dahlberg
Assay: C H Tuller

RINDERLE, A C
Grand Junction
INCLINE MINE #252, Mesa Co, U

ROBERTS & CO
Leadville
DOLLY B LEASE, Lake Co
Prod: 150-tons monthly

ROBUSH, JOHN & CO
Cripple Creek
Operators: John & Earl Robush
EL PASO MINE, Teller Co

RODGERS, J & E CROOK
Nederland
TENNESSEE MINE, S of Nederland, underground, W, dev

ST LOUIS LEASE PARTSHP
c/o Joseph Kerzon, Leadville
ST LOUIS MINE, Lake Co, idle

SAGE & BENNETT
Ucla
DOLORES CLAIM, Uravan area, U (Leased to US Vanadium)

SAN JUAN MINES CO
Silverton
Operators: J M Bradley & Assoc
SILVER LEDGE MINE, San Juan Co

SHENANDOAH-DIVES MNG CO
616 Finance Bldg, Kansas City, Mo
Pres: J W Oldham
Exec VP: C A Chase
Purch Agt: E A Larson
MINE, Silverton, Pb, Zn, Ag, Au, Cu
Supt: John Holmgren
Engr: Joe Robinson
750-TON GRAV FLOT MILL
Supt: Aldo Bonavida
Assay: James Cole

SILVER BAY MINES, INC
Silverton
BLACK HAWK, OCCIDENTAL, & BULLION KING MINES, San Juan Co

SILVER BELL MINES CO
701 U S Nat'l Bank Bldg, Denver 2
Pres & Gen Mgr: E H Sanders
Gen Supt: A A Smith
SILVER BELL MINE, Ophir, Au, Ag, Cu, Pb, W
150-TON FLOT MILL
Engr: C R Wilfley
CARBANERO MINE, Ophir, Ag, Pb, Zn
50-TON MILL

SILVER SHIELD MNG CO
Ouray
Pres: Mrs Urpo Kyto
MINES, Terrible Queen, Humbolt Groups, Mulvey properties, dev

SKALLA, A F
Uravan
Gen Mgr: A F Skalla
MONOGRAM MINES, 30 mi S of Uravan underground, U V
Foreman: J R Skalla
PAWN SPRINGS MINE #9 & 12, underground, U, V, dev
ANNA MAY & DOG TAIL MINES
Montrose Co, U

SKIDMORE MINING CO
Dove Creek,
Owner: T H Skidmore
LEGIN GROUP, SAMS & LING #2 MINES, 23 mi N of Dove Creek, underground, U V
Supt: W J MacCormick

THE SLIDE MINES, INC
401 Security Bldg, Denver
SLIDE & BLACK CLOUD MINES, 10 mi SW of Boulder, Au, Ag, Pb, Cu, Zn
125-TON GRAV FLOT MILL, idle

SLATE RIVER MINING CO
Crested Butte
Gen Mgr: R E Simpson
MICAWBER MINE, 8 mi W of Crested Butte, Zn, Pb, Cu, Ag, 30-tons
Foreman: Dwayne Gordon
MONTEZUMA MINE, 16 mi SW of Aspen Idle

SOUTH PLATTE DREDGING CO
1805 Mills Tower, San Francisco
Pres: R W Derby, Sr
Gen Mgr: R W Derby, Jr

DREDGE #1, Fairplay, Park Co, Au, Ag
Mgr: Webb Skinner
Supt: A E Kinkelman
Prod: 5,000,000-yds yearly

SPRAY, EDWIN C
1537 Washington St, Denver
SWEET HOME MINE, 4 mi up Buckskin Gulch, Park Co, undgrnd, Ag, Cu, Pb, Zn

STAMINA MNG & MLG CO
Hillside
Pres: W B Porch, Jr
Gen Mgr: W B Porch
MINE, underground, Au, Ag, Cu
Supt: E F Stacy
75-TON GRAV FLOT MILL

STONE, HAROLD
Uravan
ROCK HAVEN CLAIM, Uravan area, U (Leased to US Vanadium)

STONE, J W, MINES
Ohio
WAYNE LODE, BERTHA, BONANZA QUEEN, BUCKEYE CHIEF MINES, Ohio Au, Ag, Pb
12-TON MILL

STRATTON CRIPPLE CREEK MNG & DEV CO, Box 178, Colorado Springs
Pres: D P Strickler
VP: C W Chamberlin
Sec Treas: H L Stubbs
MINES, on Bull & Globe Hills, Cripple Creek & Victor, Box 146, Cripple Creek
Supt: J H Keener

STURM MINING CO
Rt 12, Grand Junction
Pres & Gen Mgr: Fred Sturm
VP & Purch Agt: Leona Sturm
Sec Treas: D R Sturm
Engr: Wesley Sturm
HANDY, LITTLE MAVERICK & MEAS CREEK MINES, 64 mi SW of Grand Junction, 15-tons

SUMMITVILLE CONS MINES
Summitville
Gen Mgr: G T Poxon
MINE, Cu, Au, Ag, idle
Supt: Frank Sigfird
300-TON CYANIDE FLOT MILL
Supt: O P Bradley

TANNER & SMITH
Boulder, W concentrate

TEAL & ASSOCIATES
Box 37, Boulder
Pres: G H Teal
RED SIGNE MINE, Bolder, W
Supt: S M West
25-TON GRAV MILL
Supt: W E Swanson

TELLER BASIN MNG & MLG
Montezuma
Mgr: L E Newell
CHAUTAUQUA MINE, Summit Co

TELLURIDE MINES, INC
Telluride
Pres: E S McCurdy
VP: John Ferguson Jr
Gen Mgr: C F Parker Jr
SMUGGLER UNION & TOMBOY GOLD MINES, San Miguel Co, Au, Ag, Pb, Zn
Supt: T E McCandless
Engr: C E Melbye
550-TON GRAV FLOT MILL
Asst Supt: Carl M Inga

TIDWAY & SCHUMWAY
Naturita
THUNDERBOLT MINE, Montrose Co, U

TORRES, DAVE
Naturita
MAY DAY MINE, San Miguel Co, U

TREASURE MT GOLD MNG CO
Midland Savings Bldg, Denver
Pres: G L Emerson
SANDIAGO, SAN JUAN, QUEEN, GOLDEN FLEECE & SCOTIA MINES, Silverton, Au, Ag, Pb, Zn
Supt: E R Abadie
FLOT MILL

TRONIMEL, JESS
Gateway
FLAT TOP MESA, Mesa Co, U

TYONE MINING CO
Box 488, Idaho Springs
Partners: Buerin, Smith & Fenicle
TYONE MINE, Cripple Creek
Supt: W D Finicle
Assay: George Treder

UNITED EMPIRE GOLD MINES & UNITED MINES CO
13 Citizens Nat'l Bank Bldg, Boulder
AMERICAN MINE, Au, Ag, Cu, Pb, Zn
Idle

UNITED GOLD MINES CO
Box 127, Cripple Creek
Pres: M E Shoup
Gen Mgr: M W Bowen
Asst Gen Mgr: H S Worcester
Gen Supt: C H Carlton
VINDICATOR, PORTLAND & UGM GOLD MINES, 3 mi N of Victor, Au
Supt: A H Bebee

U S GYPSUM CO
(See North Centrl & Calif listings)
GYPSUM MINE, Loveland, open pit

U S VANADIUM CO
(See North Eastern listing)
Electric Bldg, Grand Junction
Gen Supt: J W Hill
Asst Gen Supt: A O Lindquist
Plant Supt: J F Brenton
Mine Supt: E M Paris
MINE & MILL, Rifle, U, V
Supt: R D Van Zant
MINE & MILL, Uravan, U, V
Supt: J E Hopkins, Jr
200-TON ROAST LEACH PL

VALLEY MINES, INC
Box 939, Leadville
Pres: Fred H Rice
VP & Engr: C M Scott
MINE, Au, Ag, Cu, Pb, Zn, 200-tons (Leased to Erickson & Conners)

VANADIUM CORP OF AMERICA
(See North Eastern listing)
Durango
VP Chg Mining: D W Viles
100-TON ROAST LEACH EXTRACTOR, Naturita, U, V
Gen Supt: D E Harrison
Mine Supt: W B Eckman
Mast Mech: Dale Prior
Pl Supt: L A Daniels
150-TON ROAST LEACH EXTRACTOR, Durango, U, V
Gen Supt: F A Brinker
Gen Mast Mech: C T Newland
Mines Audit: G H Snyder
Mine Supt: R L Anderson
100-TON TUNGSTEN CONCENTRATOR Nederland, U, V
Gen Supt: W R Nolan
Mine Supt: Fred Peterson
(Also see Ariz, New Mex, & Utah listings)

VENTURE LEASING CO
Silverton
Partners: C L Larson, John Cook, Wm G Gianetto
GOLD PRINCE MINE, Sunny Side, Pb, Zn, Au, Ag, vein, adit
50-TON MILL, under const

VERMICULITE MNG CO
Box 109, Westcliffe
Pres: Stanley Gray
GEM PARK MINE, openpit
150-TON GRAV FLOT MILL
Supt: Dick Colgate
Mill Foreman: T A Johnson

WADE, TROY E & CO
Cripple Creek
VINDICATOR MINE, Cripple Cr dist, Au

WALKER, ART R
Silverton
QUEEN ANNE MINE, San Juan Co

WALKER, J L & ASSOC
Uravan
TRAMP MINE, Montrose Co, U

WEEMS-WEAVER MNG CO
Box 209, Salida
ANTORO MINE, Box 387, Salida, underground, Au, Ag, Pb, Zn, Cu (Leased to W E & S E Burleson)

WELLS, LEO O
Breckenridge
MANERVA MINE, Summit Co

WESTERN GOLD MINES, INC
Crown King, Ariz
Pres: Silas P Silverman
MINE, Rito Seco property, Costilla Co, Au, dev

WESTERN NON-METALLICS
330 W "D" St, Pueblo
GRINDING PL, Mica, 400-tons monthly

WESTERN STATES MINING CO
190 Alhambra St, San Francisco 23
Pres: C D Goodman
Sec: Lillian Witt
Gen Mgr: Frank Witt
AJAX MICA MINE, Box 396, Idaho Springs, open pit, mica

WILLIAMS, LAWRENCE
Gateway
BLACK MAMMY MINE, Mesa Co, U

WILLIAMSON & SON
728 U S Nat'l Bank Bldg, Denver
Gen Mgr: H M Williamson

WANO GOLD MINE & Fluorspar properties, Fluorspar
100-TON GRAV FLOT MILL

WILLMARTH MINES
Georgetown
WILLMARTH SILVER & LEAD MINES, 2 mi S of Bakerville, Pb, Ag, Au, Zn

WRIGHT BROTHERS
Uravan
PROD CLAIM, Uravan area, U (Leased to US Vanadium)

WRIGHT, WARREN
Gateway
VANAKING #1 & 2, Mesa Co, U

YORK INVESTMENT CO
Kokomo
KIMBERLY PROP, Summit Co

IDAHO

ACE GOLD MINES INC
315 Weisgerber Bldg, Lewiston
Pres: B J Nigg
Gen Mgr: F C Funke
NEW YORK GROUP, Ten-Mile dist, undergrount, Au, Ag, W
Supt: Carl Funke
Foreman: H W White
50-TON GRAV FLOT MILL, idle

AJAX MINE
Shoshone County, Lelande dist
Ag, Pb, Zn
(Leased to J Hodges)

AMERICAN SILVER MNG CO
123 W 4th Ave, Spokane, Wash
Pres: E W Conrad Jr
MINE, 1 mi S of Osburn, undground, Ag, Cu, dev

AMERICAN SMELTING & REFINING CO, (See North Eastern listing), Wallace
Mgr: J E Berg
Purch Agt: P L White
JACK WAITE MINE, Duthie, adit, Pb, Zn, Ag
Supt: C H Blackwell
300-TON FLOT MILL
Supt: Harvey LeGault
(Operating under agreement with Jack Waite Mining Co)

AMY SILVER-LEAD CO
Box 358, Kellogg
Pres & Gen Mgr: C Anderson
Sec: Christine Brown
AMY & AMY MATCHLESS MINES, 8 mi W of Kellogg, Ag, Pb, Zn, idle
FLOT MILL

ANACONDA COPPER MNG CO
(See North Eastern listing)
Conda
MINE, Conda, Phosphate Rock
Supt: L E Traeger
Foreman: Walter Dezell
450-TON CRUSHING & DRYING PL
SUNSET GROUP, Beaver & Summit dist, Pb, Ag, Zn (under lease)

ANCHOR MINES, INC
Box 2178, Boise
Pres: C W Turner
Sec: W H Buchingham
Legal Agt: Frank Martin Jr
GOLDEN ANCHOR MINE, 50 mi E of Riggins, Au, Ag, idle
FLOT MILL

ANDERSON, A G
Mackay
HORSESHOE MINE, 4 mi SW of Mackay underground, Pb, Ag, dev

ANTIMONY GOLD ORES
246 Sonna Bldg, Boise
Pres: J J Oberbillig
SUGAR CREEK GROUP, Yellow Pine Mng dist, Au, Ag, W
JOHNSON CREEK GROUP, idle

APACHE MINES CO
123 S Maple St, Jerome
Pres: T C Butler Jr
VP: L M Lindsey
Sec: H P Jayne
Treas: Guy S Simons
Gen Mgr: Frank Humphrey
Engr: O L Bishop
APACHE MINES, Box 387, Hailey, 4 mi W of Hailey, Ag, Pb, Zn, Au
APACHE MILL, 150-ton flot
Asst Mine & Mill Supt: P O Landbury
SMELTER, Murray, Utah, Pb, Zn, Ag

ATHO & SAGE
Rocky Bar
GOOD LUCK MINE, Elmore Co, Bear Creek & Featherville dist
Owners: Lafe Atho & Howard Sage

AUSICH, JOSEPH E
Box 381, Mackay
CHAMPION MINE, Custer Co, Pb, Zn, Cu
Prod: 15-tons

AUXER GOLD MINES
Bonner County
Pres: H J Campbell
AUXER MINE, Pend Oreille dist, Au, Ag, Zn

BANNER-IDAHO MINES, INC
Scott Bldg, Wallace
Pres: John Davis
VP: C W Bentley
Sec Treas: J W Coumerilh

BANNOCK APEX MINES, INC
Arbon
Pres: Lee A Newport
MINE, Arbon, Cu, Pb, Zn, Au, Ag, Cr, Ni, Fe, Mo, V, Mn, idle

BAYHORSE MINE, INC
Challis
Pres: O J Salisbury
VP & Gen Mgr: W B Seigert
Treas: O O Langness
PACIFIC, BEARDLSEY, RAMSHORN, & FOREST ROSE GROUPS, 15 mi SW of Challis Pb Ag, Zn, Cu Au
GRAV FLOT MILL, 100-tons

BEHRENS BROS
Elk City
Mgr: W T Behrens
LITTLE MOOSE CR PLACERS, Idaho Co, Elk City dist

BELL, DAVID E
Mackay
ALURA, McFADDEN & YANKEE FORK MINES, Custer Co, Ag, Pb, Zn

BEVAN, MAGNUS
North Fork
SAWLOG GROUP, 36 mi S of Salmon City, dev
50-TON MILL

BIRCH CREEK MINING CO
250 Broadway, Idaho Falls
Pres & Gen Mgr: George Brunt
Sec & Mgr: L S Merrill
SCOTT MINE, Du Bois, Ag, Pb
Engr: R T Shane

BLACK BEAR MINES CO
Wallace
Pres: W H Hanson
BLACK BEAR GROUP, Near Gem, Pb, Zn, Ag
(Leased to G W Ringel)

BLUEBIRD MINE
c/o M C Settles, 2020 Pacific, Spokane, Wash
MINE, Lemhi Co, Ag, Cu

BLUE GULCH MINE
316 Juniper St, Nampa
Mgr: T A Gregory
MINE, Owyhee Co, Au, Ag

BOISE KING PLACERS
Twin Springs
Pres: G G Titsell
MINE, Bear Cr dist, dredge, Au, Ag

BRADLEY MINING CO
(See Calif listing)
Bradley Field, Boise
Chg of Oper: J D Bradley
Mgr: E E Coleman
Asst Mgr: J A Mecia
Purch Agt: L D Richardson
YELLOW PINE MINE, Stibnite, open pit, Sb, W, Au, Ag
Supt: Edwin Adams
Asst Supt: H J Servant
Equipment Supt: G R Hansen
2,400-TON FLOT CONCENTRATOR
YELLOW PINE SMELTER
Supt: John Anderson
Smelter Supt: F P Sounders
Asst Smelter Supt: Dean Wild
Met: Robert J McRae
IMA MINE, Patterson, W, Ag, Pb, Cu
Mgr: Charles Hathorn
150-TON GRAV FLOT MILL
Supt: Garnet McCall

BROADHURST, L E
c/o T C Butler, 3015 Apple St, Rt 9, Boise
Owner: A K Wilson
Gen Mgr: T C Butler Jr
PEARL MINES PROJECT, Pearl, 30 mi NW of Boise, Pb, Zn, Ag, Au
Supt: E G Taylor
PEARL MILL, 25-ton grav flot
Supt: R L Eubanks

BROUGH, FRED J
Salmon
POPE-SHENON MINE, Lemhi Co, Cu

BROWN BEAR MINES, INC
405 Cedar St, Seattle 1, Wash
Sec: A A Fagnaut
BROWN BEAR MINE, Pend Oreille dist

BUCHMAN, BRECKON & NORDEN
Clayton
Gen Mgr: J A Norden
RED BIRD MINE, 6 mi NW of Clayton, adit, Ag, Pb, 500-tons monthly

BUNKER HILL & SULLIVAN MNG & CONC CO, Box 29, Kellogg
Pres: S A Easton
VP & Gen Mgr: J B Haffner
Asst Sec: I A Robson
Purch Agr: E P Riotti
MINE, Kellog, Ag, Pb, Zn
Supt: S McDougall
Asst Supt: R S Hooper
FLOT MILL, 2000-tons
Supt: C Y Garber
Asst Supt: Frank McKinley
Engr: U E Brown
Engr, Mech: A C Stevenson
SMELTER & 400-TON FUMING PL & ANTIMONY PL
Supt: F C Pedderson
Asst Supt: J B Schuettenhein

CABIN MINE
Dubois
Pres: F G Worthing
MINE, Reno dist, Lemhi Co, Pb

CALERA MINING CO
Blackbird Division, Cobalt
Pres: H H Sharp
Mgr: E B Douglas
Purch Agt: J W Caples
BLACKBIRD MINE, 42 mi W of Salmon, underground, Co, Cu
Engr: C J Whitley
Supt: R B Meen
Foreman: R L Saderberg
Geol: Ward Carithers
Elec Engr: J P Smith
Mech Engr: A W Legard
1000-TON FLOT MILL
Supt: C O Bower
Foreman: Kenneth Hill
Assay: Frank Tipton

CALLAHAN ZINC-LEAD CO
VULCAN SILVER-LEAD CORP, property leased to American Smelting & Refining Co

CAMAS MINING CORP
601 Eastman Bldg, Boise
Pres: C E Carver
Dir: C P Williams
BALTIMORE MINE, Hailey, Au, Ag, Pb, Cu, dev
150-TON FLOT MILL, dev

CANYON CREEK MINES
1115 Vermont St, Boise
Owner: Hal Baker
MINE, Idaho City, Au, Ag, Cu, Pb, Zn

CAPITOL SILVER LEAD MNG CO
Gearon Bldg, Wallace
Pres: H C Mowery
VP: Joe Swan
Sec Treas: H M Husmann
MINE, Ag, Pb, dev

CHALLIS VIEW MINE
Challis
Operators: Smith & Buchanan
MINE, Custer Co, Bayhorse dist, Ag, Pb

CHILDS, ELDON
20 E 48th South St, Murray
HOPEFUL CLAIM, Custer Co, Pb, Zn, Idle

CLAYTON SILVER MINES
Box 890, Wallace
Pres & Gen Mgr: Wm Yeaman
VP: A H Featherstone
Sec: Ray Morrison
MINES, Clayton, underground, Au, Ag, Cu, Pb, Zn
Mgr: R J Legard
Foreman: H E Strong
Engr: Norman Smith
100-TON FLOT MILL
Foreman: Alfred Nelson

CLARK, EDWARD B
Clark Fork
LUCKY OPAL & SURPRISE GROUPS, 3 mi From Clark Fork, dev

COEUR D'ALENE MINES CORP
Gearon Bldg, Wallace
Pres: H C Mowery
Gen Mgr: Mike Kinsella
VP: Frank McKinley
Sec Treas: W A Callaway
Purch Agt: W P Wylie
MINERAL POINT MINE, Osborn, underground, Cu, Ag, Sb
Foreman: Steve Vaclav
Engr: Fred Morin
800-TON FLOT MILL, dev
Assay: Peter Mack

COEUR D'ALENE SILVER GIANT, INC, Box 838, Kellogg
Pres & Gen Mgr: Harry G Alway
VP: R E Neyman
Sec Treas: Wayne A Brainard
MINE, E Fork of Big Cr, Kellogg, Ag, Pb, idle
Engr: John B Platts
82 LODE CLAIMS, Shoshone Co, under working contract

COME BACK MINE
Garden Valley
MINE, Boise Co, Boise Basin dist (Leased to Boise Basin Mining Co, 803 Iowa St, Boise,)

CONSTITUTION LEASE
Box 507, Wallace
Mgr: S H Garrett
MINE, Shoshone Co, Pb, Ag, Zn

CONTINENTAL MINING CO
Box 469, Wallace
VP: J E McKay
Sec Treas: H F Magnuson
Gen Mgr: C E Small
CONTINENTAL MINE, Porthill, Pb, Ag, Zn, Cu
500-TON HMS PL; 100-TON FLOT MILL
Mill Supt: J J Snider

CRAMPTON, T S
Centerville
CLAIMS, Pioneerville, Au, Zn, idle

CROCKER, GROWER & JUDD
Bellevue
MINE, Blaine Co, Ag, Pb

CUBA MINING CO
Wallace
Pres: W H Hanson
MINES, 2 mi from Wallace, Ag, Pb, dev

CUDDY MOUNTAIN MNG CO
711 Hutton Bldg, Spokane 8, Wash
Pres & Gen Mgr: W R Bellows
Sec: Wellman Clark
BLUE DOG MINE, Weiser, open pit, Au, idle

CUSTER COPPER CORP
4212 Franklin Rd, Boise
Pres & Gen Mgr: W P Barton
VP: David E Bell
EMPIRE MINE, MacKay, underground, Cu, Au, Ag, idle
100-TON FLOT MILL

DAISY MNG & MLG CO, LTD
916 Larson Bldg, Yakima, Wash
Pres: S D Parker
MINE, near Hailey, Au, idle

DARLAND, JOHN & T A
Cuprum
SOUTH PEACOCK MINE, 48 mi NW of Council, undrgrnd, Au, Cu, Ag, dev

DAY MINES, INC
Wallace
Pres & G n Mgr: H L Day
VP: Paul B Jessup
Sec: S F Heitfeld
Purch Agt: G T Kelton
Engr: R K Word
AURUM MINES, 2 mi NW of Republic, underground, Au, Ag, idle
DAYROCK, MONITOR, TAMARACK, SHERMAN & HERCULES MINES, Wallace, shaft, adit, Pb, Zn, Ag
Supt: Rollin Farmin
4 FLOT MILLS
Supt: L A Grant

DENVER DEVELOPMENT CO
Box 989, Kellogg
Partners: Bell, Norgaard & Nugent
Purch Agt: D Bell
LITTLE PITTSBURG MINE, Pine Cr, underground, Ag, Pb, Zn
Supt: Inar Norgaard
Foreman: W B Jarvey
150-TON FLOT MILL
Supt: H G Rouse

DEVIL'S TOE DREDGING CO
Shoup
Pres: A P Smothers
Sec: Dave Hausel
MINE, 29 mi W of Shoup, dragline placer, Au, Rare Earth, 100-yds

DIAMOND PEAK MINES CO
Arco
Pres: A W Barnes
Gen Mgr: M M Dahle
Sec: R C Walker
BADGER MINE, Arco, Ag, Pb, idle

DOME MINES
Howe
WILBERT MINE, Howe, Pb, Ag, idle
Gen Mgr & Purch Agt: W H Gibson
Mgr: C A Dye
Foreman: C Mac Dye
200-TON FLOT MILL

DOUGLAS MINING CO, LTD
Box 320, Wallace
Pres: S A Easton
VP: R E Sorenson
Sec: L E Hill
DOUGLAS MINE, Pine Cr, 13 mi SW of Kellogg, Zn, Pb, idle

DUNDAS & MORSE
Pierce
CIRCLE OF GOLD MINES, #1, 2, 3
9 mi E of Pierce, adit, dev

DUVALL CO
210 Eccles Bldg, Ogden, Utah
GEM GROUP, Cassia Co, Blackpine dist

ECHO MINING CO
Wallace
Pres: W H Hanson
MINES, Burke, Ag, Pb, dev

ELKHORN BAR PLACERS
Shoup
Owner: A P Smothers
MINE, 52 mi from Shoup, dragline placer, Au, Rare Earth

ELLIS, ELLIS & WILCOX
Clayton
Pres: Alvin Ellis
SKYLINE MINE, Custer Co, Ag, Cu, Pb, Zn

EUREKA SILVER KING MINES
532 First Nat'l Bank Bldg, Boise
SILVER KING GROUP, Valley Co, on South Fork of Salmon River

FEDERAL MNG & SMELTING CO
516 Bank St, Wallace
Pres: K C Brownell, New York
VP: R F Goodwin, New York
Gen Mgr: J E Berg
Personnel Mgr: L I Markel
Purch Agt: Percy L White
Supt of Mines: W J Combe
Supt of Mills: G S Price
Engr Supt: W A Boyer
Met: George Deshler
PAGE MINE, Page, vein, shaft, square set stoping, Pb, Ag, Zn
Supt: T M Tower
Asst Supt: S E Kappel
Acct: M G McCandless
Foreman: Phil Demaree
500-TON FLOT CONCENTRATOR
Supt: Roy McKinley
MORNING MINE, Mullan, adit, 350-tons, Zn, Pb, Ag, Cd
Gen Supt: A P Nelson
Supt: R E Walters
Asst Supt: H H Shook
Foreman: Earl Brasher
1,200-TON FLOT CONCNT
Supt: G S Price
Asst Supt: G A F Deshler
FRISCO MINE, Gem, shaft, adit, Ag, Pb, Zn
Supt: G B Christian

FLAGSTAFF MINING CO
Kennewick, Wash
Pres: E H Behrman
MINE, Bear Cr dist, Au, Ag, idle
30-TON MILL

CAMBRINUS SURPRISE CO & ILLINOIS MINE, Idaho City
Pres: E T England
Gen Mgr: C M Lovenstein
Purch Agt: J W Duquette
ILLINOIS & SURPRISE MINES, Au
Engr: V E Clayton
10-STAMP MILL

GARFIELD SILVER LEAD MINES
Hailey
Pres: L F Heagle
VP: E W Fox
Sec Treas: D M Jacobs
GARFIELD & WESTLAKE MINES, Hailey Ag, Pb, Zn, Fe
Supt: J D Dehlin
Geol & Engr: Arthur Lakes
GARFIELD MINE, Muldoon, Au, Ag, Pb, Zn
Foreman: J Dehlin
EAGLE BIRD MINE, Little Wood River dist, Pb, Zn

GEM STATE CONS MINES, INC
Sycamore Dr, Rt 9, Boise
Pres & Gen Mgr: T R Baugh
VP: J M Rollins
Sec: V J Parker
Treas: G E McKenney
GEM STATE MINE, Pearl, 25 mi N of Boise, adit, Au, Ag, Pb, Zn
Supt: G E McKenney
Engr: D E Anderson
250-TON GRAV MILL

GEN MINES CORP OF IDAHO
416 Empire State Bldg, Spokane, Wash
Pres & Gen Mgr: H G Loop
VP: Chris Roholt
Sec: E I Fisher
Geol: J V Platt
GENERAL MINE, P C Star Rt, Smelterville, shaft, adit, Au, Ag, Cu, dev

GOLCONDA LEAD MINES, INC
Rossi Insurance Bldg, Wallace
Pres & Gen Mgr: A H Featherstone
VP: John Featherstone
Sec Treas: H F Magnuson
GOLCONDA MINE, 3 mi E of Wallace shaft, Pb, Ag, Zn
Supt: Wray Featherstone
Foreman: Theodore Reel
Engr: Richard May

FLOT MILL, Mullan Rd, Wallace
Supt: C E Bloom
Foreman: Richard Holmberg
Assay: Peter Mack

GOLD COIN MINE
Star Rt 2, Sand Point
Mgr: J Bessemer
MINE, Bonner Co, Ag, Pb, Zn

GOLD HUNTER MINES, INC
R 1501, 111 W Washington St, Chicago 2, Illinois
Pres: J D Murphy
Gen Mgr: L M Norris
MINE, E of Mullan, Ag, Pb, Zn
500-TON FLOT MILL

GOLDEN DIVIDEND MNG
Idaho City, Au, idle
Owner: Chester Lamb, 1708 Boise Ave, Boise

GOLDEN SEAL MNG & MLG CO
Box 2307, Boise
Pres: E K Lorimer
Sec: M German
MINE, near Dry Cr, idle

GOLDEN STRINGER #1-5
Box 95, Atlanta
Mgr: E T Seaton
MINES, Elmore Co, Au, Ag, Pb, Zn

GRANADA LEAD MINES, INC
Box 257, Wallace
Pres: E G Gnaedinger
VP: R L Roundy
Sec Treas: A H Featherstone
Purch Agt: W H North
GRANADA MINE, Wallace, Ag, Cu, Pb
Supt: R L Roundy

GREGOR MINES, INC
1519 First Ave, Seattle 1, Wash
Pres: C H Mengedoht
Gen Mgr: W M Parsons
Sec Treas: C H Woodis
MONOLITH MINE, Shoup, Au, Ag, Pb
Mgr & Engr: P M Sorensen
60-TON FLOT MILL
Foreman: Butch Tibbetts

HACKET, HERBERT H
Riggins
SHAMROCK GROUP, Florence & French Cr, placer, Au, Ag
hydraulic dredge, dev

HANSY COPPER & GOLD MINES
Box 588, Wallace
Pres: Osa Belsby
VP: Osborne Belsby
Gen Mgr: Sam Peterson
HANSY MINE, 3 mi S of Adair, vein, Cu, Au, Ag

HAYDEN HILL CONS MNG CO
612 Chronicle Bldg, Spokane, Wash
Pres: W T Anderson
VP: J B Phillips
Sec: C C Anderson
Gen Mgr: R R Weideman
PURIM GROUP, Silver Belt, Coeur D'Alene (Leased to Silver Dollar Mng)

HAY FORK MINE
Idaho City
Operator: Hal R Jarvic
MINE, Au, Ag, idle
10-TON MILL

HECLA MINING CO
Box 320, Wallace
Pres & Gen Mgr: A W Witherspoon
Sec Treas: L J Randall
Gen Supt: R W Neyman
Purch Agt: R G Hull
HECLA MINE, Burke, Pb, Zn, idle
Foreman: Lee Messerly
900-TON FLOT CONC
Met: N J Sather
Assay: J M Simpson

HEINE MINES, INC
Meridian, Boise, Bellevue
Pres: Clinton Barber
VP: James Hawley
Sec Treas: A L Heine
BELLEVUE GOLD GALENA, Bellevue, Au, Ag, Cu, Pb, Zn, Mn, V, idle
24-TON BEAM SMELTER

HEMBREE & ZOOK MNG CO
Box 183, Leadore
MOUNTAIN BOY MINE, Lemhi Co, Texas dist, Ag, Cu, Pb

HERMADA MNG CO
Twin Springs
Pres: Enerst Oberbillig
Mgr: Gilbert Pearson
VP: Jess Hawley, Jr
Sec Treas: Carol Oberbillig
HERMADA MINE, 20 mi W of Atlanta, open pit, Sb, 20-tons monthly
TALACHE CUSTOM FLOT MILL, Atlanta

HIGHLAND-SURPRISE CONS MINING CO, Gearon Bldg, Wallace
Pres: F J Luedke
VP: H C Smith
Sec Treas: W A Callaway
Gen Mgr: R D O'Brien
MINE, Pine Cr near Kellogg, underground, Zn, Pb, Ag
Geol: J B Platta
Foreman: Victor Giroux
300-TON FLOT MILL
Foreman: R A Rice

HILL TOP MINE
122 S 1st St, Pocatello
Mgr: Joe Hamilton
MINE, Lemhi Co, Au, Ag, Pb, Cu

HOPE SILVER LEAD MNG, INC
Box 152, Clark Fork
Pres: Glenn C Lee
VP: Ed Groenig
Sec Treas: L P Larson
HOPE MINE, underground, Pb, Ag, Zn
Foreman: E T Shields
Engr: Harold Shields
150-TON FLOT MILL, dev

HORNSILVER MNG & MLG CO
Wallace
Prs: W H Hanson
MINES, 3 mi S of Wallace, Ag, Pb, dev

HULL LEASE
Wallace
Gen Mgr: H J Hull
Purch Agt: August Voltolini
GEM & FRISCO MINES, Gem, Ag, Pb, Zn
Supt: Harry Voltolini
100-TON FLOT MILL
Supt: Fausto Voltolini

HUMPS OF GOLD MINE
c/o Richard May, Wallace
MINE, Oragrande, Au, Ag, idle

HYPOTHEEK MNG & MLG CO
510 Bank St, Wallace
Pres: R L Brainard
Mgr: R H Kingsbury
HYPOTHEEK MINES, Kingston, Au, Ag, Pb
Supt: J T Kingsbury
KING OF PINE CR MINE, W of Pine Cr

IDAHO BERYLLIUM & MICA
Troy
Ch: C V Peckham
Pres: H G Peckham
Sec: Lawrence Smith
CLAIMS, Mica Mt, Latah Co, Mica, Beryl & rare earths
MICA GRINDING MILL, Muscovite & Lawrence

IDAHO-CANADIAN DREDGING
Box 2127, Boise
Prs & Gen Mgr: H B Murphy
VP: Miles M Young
Sec Treas: G E Murphy
MINE, 75 mi N of Boise, placer, Au, Ag, Monazite, Ilmenite, Garnet, Zircon
Supt: Miles M Young
Asst Supt: W J Bennett

IDAHO CONS MINES
4109 Arcade Bldg, Seattle, Wash
Pres: Edmund G Wilson
VP: R D Tripple
Sec: H D Merrick
Treas: C J Colasurdo
Gen Mgr: Charles Kapp
TWIN PEAKS MINE, 18 mi S of Salmon, adit, Pb, Cu, Ag, Co, Au
Engr: Allen C Merritt
75-TON FLOT MILL, dev

IDAHO CUSTER MINES, INC
Scott Bldg, Wallace
LIVINGSTON MINE, 16 mi S of Clayton, Pb
200-TON MILLING PLANT

IDAHO GARNET ABRASIVE CO
Box 1452, Spokane, Wash
MINE, Fernwood, Garnet sand, placer, 1,000-yd dragline dredge

IDAHO GOLDFIELDS, INC
1114 W Indiana, Spokane, Wash
Pres & Gen Mgr: W M Frederichs
Sec Treas: James Milne
DONAHOE LEASE, near Kellogg, Pb
Foreman: E A Oerling
BLACK ROCK MINE, Wet Gulch, open pit, Au, idle

IDAHO LAKEVIEW MINES CO
502 Columbia Bldg, Spokane, Wash
Pres: J L Drumheller
Sec Treas: L R Gordon
IDAHO LAKEVIEW MINE, near Lakeview, Ag, Pb, Zn
100-TON FLOT MILL
Mine & Mill Supt: E A McDaniel

IDAHO STAR MINING CO
E 1302 Neward Ave, Spokane, Wash
Pres: R T Lawrence
MINE, St, Joe dist, near Avery, Au, Cu, Co, idle

IDAHO-WARREN DREDGING CO
Centerville
Pres & Gen Mgr: A F Baumhoff
Sec Treas: G T Eyman
ELK CITY & YANKEE FORK MINES, Au
Dredgemaster: J R Johnson
4,000-yd bucket dredge, idle

INDEPENDENCE PLACER MNG
Gyde-Taylor Bldg, Wallace
Pres: William Fahle
MOOSE CR MINE, Moose City, Au (Leased to W J Mullins & Assoc)

INTERNAT'L LEAD & COPPER
Idaho Falls
SILVER CONS MINE, Lemhi Co, Ag, Pb, Cu, Zn

IRON MT MINING CO
7th & Commercial Sts, Weiser
Pres: C L Randall
Mine, Au, Ag, Cu, Pb, idle
Supt: Frank Mortimer

JACKSON, HELEN
North Hollywood, Calif
LAST CHANCE GROUP, Custer Co, Bayhorse dist (Leased to Harold D Ivie, Box 442, Mackay)

JESSEN, MAX C
Oragrande
TRIANGLE PLACER, 8 mi S of Oragrande, hydraulic

JESSIE MINE
Eagle
Operator: L M Sloper
MINE, Summit Flat dist, Au
35-TON MILL

KIMBALL & IVIE
Mackay
TURTLE MINE, 12 mi N of Challis Cu, Pb, Ag, vein

KING OF PINE CR MNG CO
612 Chronicle Bldg, Spokane, Wash
Pres & Gen Mgr: C C Anderson
VP: E H Carlson
Sec: L Howe
MINE, Wallace, idle

LAKEVIEW LEASE
647 Peyton Bldg, Spokane, Wash
Owner: R B Austin
WEBER MINE, Athol, Idaho, vein, adit & open pit, Ag
Foreman: Otto Meyer

LARSON, R W
South Fork Lodge, Golden
SOUTH FORK MINE, 11 mi E of Golden, underground dev, Au, Ag

LATEST OUT MINE
Gilmore
Mgr: Milo Zook
MINE, Lemhi Co, Ag, Pb, Cu

LAWRENCE CONS MINING CO
Clark Fork
Pres: C I White
Sec: C I White, Jr
LAWRENCE MINE, Clark Fork Pb, Ag, Sb
50-TON CONC, dev

LEAD BLOSSOM MINING CO
Wallace
Pres: W H Hanson
MINES, City of Wardner, Ag, Pb, dev

LEAD ZONE MINE
Box 1602, Boise
MINE near Council, Ag, Pb, Zn

LEONARD BROTHERS
Silver City
Gen Mgr: F L Leonard
PAUPER GROUP, 2 mi SE of Silver City, shaft, adit, Au, Ag, Cu
GRAV, AMAL MILL, 2-tons

LEONARD, MRS R H
Silver City
DAVIDSON GROUP 2 Mi E of Silver City, adit, Au, Ag

LEWIS MINE
Homedale
Operator: John A Turner
MINE, Carson dist, Au
150-TON AMAL MILL

LIVINGSTON MINES, INC
3210 W 74th St, Seattle, Wash
Pres: Harry C Petrie
Gen Mgr: Henry Mears
LIVINGSTON MINE, Bayhorse dist, 16 mi S of Clayton, Pb,
200-TON MILL

LOOKOUT MT MNG & MLG CO
Box 818, Kellogg
Pres: William Penny
Gen Mgr: L S Harrison

LOOKOUT MT MINE, Pine Creek, undergrount, Pb, Zn, dev

LUCKY FIVE MINING CO
Box 1182, Spokane, Wash
Sec Treas: A M Logadon
MINE, 4 mi N of Orogrande, placer, Au

LUCKY FRIDAY SILVER-LEAD MINES CO, Wallace
Pres: John Sekulic
MINE, Hunter dist, near Mullan, Pb, Ag, Zn, Cu, dev

LYONS, J W
Paris
LEONE MARIE #1 & 2, Bear Lake dist, Ag, Pb
Operators: Gambling & Skinner

MACKAY EXPLORATION CO
4212 Franklin Rd, Boise
Pres: W P Barton
VP: D E Bell
EMPIRE MINE, 3 mi W of Mackay, Cu, Au, Ag, idle

MAMMOTH MINE
Grangeville
Operator: George Grebe
MINE, Dixie dist, Idaho Co, Au
24-TON AMAL MILL, idle

MARENHOLTZ, MRS C V
Rt 8, S 39th St, Boise
LAST CHANCE & ROCKY BAR PLACERS, Centerville, idle

McGREGOR MINING CO
Box 45, Cataldo
Pres: M C Jacobson
Sec: Mrs Grace Jacobson
McGREGOR MINE, Cataldo Gulch, Au, Ag, Cu, Pb, Fe, idle

MERGER MINES CORP
Box 454, Coeur d'Alene
Pres: C H Hunter
VP: W L Erwin
Sec Treas: J B Nelson
MINE, Evolution dist, Osborn, dev
Foreman: Glen E Good

METALINE & PINE CREEK CONS MNG CO, Scott Bldg, Wallace
Pres: Stanley Easton
VP: J B Hoffmar
(Controlling stock interest owned by Sullivan Mng Co, Wallace)

METROPOLITAN MINES CORP
Box 497, Wallace
Pres & Gen Mgr: R H Kingsbury
Sec Treas: A J Teske
METROPOLITAN GROUP, Evolution dist, Osborn, undgrnd, Ag, Cu, Pb
(Dev by Sunshine Mining Co)

MEYER, WILLIAM J
Box 121, Grangeville
PLACER, Elk City dist, Au, Ag

MONARCH GROUP
Murray
Owner: W H Hanson
MINE, Ag, Pb, dev

MOUNTAIN KING MINE
Box 32, Hailey
Mgrs: Fred & Earl Shirts
MINE, Custer Co, Au, Ag, Cu, Pb, Zn

NABOB SILVER LEAD CO
Box 890, Kellogg
Pres: T R Jones
Gen Mgr: C C Dunkle
MINE, Wallace, Pb, Zn
300-TON FLOT MILL
Assay: C V Barto

NATIONAL MINES, INC
c/o O E Cannon, Mt Home
Pres: W L Baker
VP & Gen Mgr: C A Dye
Sec: R M Wetherall
Treas: Blythe Clemons
SENTINEL MINE, 20 mi N of Howe, vein adit, under dev

NATIONAL METALS
Hailey
Gen Mgr: C A Dye
HIDDEN TREASURE MINE, on Little Smokey, Ag, Pb, Zn

NEW HILARITY MINING CO
Box 27, Spokane Wash
Pres: R W Neyman
VP: W Brainard
Sec Treas: E K Barnes
Asst Sec Treas: E M Borjessan
MINE, Box 943, Wallace, idle
Foreman: Eugene C Iverson

NIXON, WM A ESTATE
Rocky Bar
Operator: Oscar Pearson
EMPIRE GROUPS, Elmore Co

NORTH FORK DEV CO
Wallace
Sec: W H Hanson
MINE, Shoshone Co, Ag, Pb, idle

OVERLAND TRUST
Hailey
Pres & Gen Mgr: Hall Parke
Sec: Clara Kittzmiller
OVERLAND & EDRES MINE, Bellevue, underground, Au, Ag, Pb, Zn, idle
Engr: A L Anderson
Assay: A Hall

PACK, EARLE A
Box 1186, Boise
MONAZITE PLACER CLAIMS, on Clear Creek, 8 mi S of Cascade, dev

PAYMASTER, INC
Box 930, Kellogg
Pres: F N Marr
VP: C D Randall
Gen Mgr: J C Kieffer
Engr: James Trumbull
PAYMASTER MINE, Box 182, Carey
Mgr: W A McCoy
Foreman: Ernest W Lomas

PINE CREEK PLACER CO
Hereford, Ore
Pres: R M Davidson
PLACER MINE, Au, idle
Gen Mgr: L A Hoalst
Engr: Fred Bower

PLYMOUTH DEV CO, INC
Box 1163, Idaho Falls
PLYMOUTH GROUP, Lemhi Co, Pb

POLARIS MINING CO
Box 320, Wallace
Pres: A W Witherspoon
VP: J L McCarthy
Sec: J R Matthews
Treas: L J Randall
Purch Agt: R G Hull
POLARIS MINE, 7 mi W of Wallace, shaft, Ag, Cu, Pb
Supt: R W Neyman
Foreman: George Grismer
Geol: R E Sorenson
300-TON FLOT MILL
Supt: N J Sather
Foreman: Jack Dalgleish
Assay: Tom Hydorn

PREMIER STAR MINING CO
Box 132, Osborn
LUCRETIA CLAIMS, Shoshone Co

PROFILE TAMARACK MINES
309 SW 4th Ave, Portland, Ore
Pres: C E Thompson
Sec: E P Slovarp
CENTRAL GALENA GROUP, Yellow Pine, underground, Ag, Pb, Zn
Gen Mgr: H T Abstein

QUIGLEY MINING SYNDICATE
306 Blanchard St, Apt 702, Seattle, Wash
Pres: W J Lobus
QUIGLEY MINE, Hailey, Pb, Ag, Zn, underground dev

RAINBOW MNG & MLG CO, LTD
Box 880, Wallace
Pres: H C Mowery
Sec Treas: W A Callaway
RAINBOW #1 GROUP, Evolution dist, Cu Ag, Pb, Zn, Dev

RAMSHORN MINES CO
321 Felt Bldg, Salt Lake City, Utah
Pres: W W Murray
Sec: Leo Eager
RAMSHORN & BEARDSLEY GROUPS, Bayhorse dist, Challis, Ag, Pb
(Leased to Bayhorse Mines Inc)

RARE EARTHS', INC
1535 Lupton Ave, San Jose, Calif
Mgr: W W Prather
Treas: Bealor Waggoner, McCall
WARREN MEADOWS MINE, Warren dist, bucket line dredge

RARE METAL MINES, INC
E 601 Crown Ave, Spokane, Wash
Pres: Arthur L Hooper
MINE, Bonner Co, Au, Ag, idle

RICHARDSON PLACERS
Box 756, Salmon
Agt: Mrs J R Shoup
Mgr: W H Shoup
PLACERS, 32 mi W of Salmon, dragline, hydraulic dozer, Au, Ag

ROCK CREEK GROUP
Box 27, Idaho City
Partners: John & Glenn Larson
MINE, Au, Ag, idle
7-TON GRAV MILL

ROMBACK, RICHARD
Rt 2, Bonley
ELLIS GROUP, Custer Co
Operator: C F Wilcox, Clayton

ROMNEY, G
Howe
MINES, Lemhi Co, Spring Mt dist, Ag, Cu, Pb

SCHULTZ, HARRY A
Idaho City Stage, Boise
RAINBOW GROUP PLACER, Au

SHUCK'S PLACER
Elk City
PLACER, Idaho Co, Au, Ag

SIDNEY MINING CO
Sidney Bldg, Kellogg
Pres: W T Simons
Gen Mgr: M C Brown
Sec Treas: F E Marler Jr
Purch Agt: A G Pippo
SIDNEY MINE, 15 mi S of Kellogg, shaft, adit, Zn, Ag, Pb
Foreman: Ed Coe
Engr: C H Reynolds
Mech Engr: Zane Smith
200-TON FLOT MILL
Supt: C A McKinley

SILVER BANNER MINING CO
Tabor Building, Wallace
Pres: B W Stewart
VP & Gen Mgr: S K Garrett
Sec: H J Hull
Treas: C W Six
SILVER BANNER MINE, 8 mi E of Wallace, dev

SILVER BOWL, INC
Box 836, Kellogg
Gen Mgr: R W Neyman
Sec: Wayne A Brainard
SENATOR STEWART MINE, Deadwood Gulch, Ag, Pb, Zn
Supt: Eugene Iverson
Engr: John B Platts
FLOT MILL, dev

SILVER CABLE MNG CO, INC
127 Brown Ave, Kellogg
Pres & Gen Mgr: G W Ringle
MINE, near Mullan, Pb, Zn, idle

SILVER CHIEFTAIN CO
612 Chronicle Bldg, Spokane 8, Wash
Pres, Gen Mgr: Elmer E Johnston
VP: C C Anderson
Sec: W T Anderson
Purch Agt: R R Weideman
SILVER DOLLAR MINE at Osborn, underground, Ag, Pb, Cu
Mine Foreman: Horace Smith

SILVER HILLS MINING CO
1258 Crandall Ave, Salt Lake City, 6, Utah
Pres: A A Firmage
Sec-Treas: L M Francis
BUSY BEE & JOVEON GROUPS MINES, 10 mi NE of Strevell, underground

SILVER STAR-QUEENS MINES, INC
Box 158, Hailey
Pres & Gen Mgr: N T Davis
VP: R E Kreuger
Sec Treas: F L Johnson
OLD MINNIE MOORE & QUEEN OF THE HILLS MINES, 1 1/4 mi W of Bellevue, Pb, Ag, Zn
Vein under dev by shaft
Supt: R T Fitz
Geol & Engr: C E Milner, Jr

SILVER SUMMIT MINING CO
Box 320, Wallace
Pres: Harry P Pearson
VP: A W Witherspoon
Sec-Treas: L S Eddins
Purch Agt: R G Hull
Gen Mgr: R W Neyman
SILVER SUMMIT MINE, 7 mi W of Wallace, Osborn, shaft, adit, Ag, Cu
Mine Foreman: G Grismer
Engr & Geol: R E Sorenson
300-TON FLOT MILL rented from Polaris Mng Co.
Supt: N J Sather
Foreman: Jack Dalgleish

SILVER SYNDICATE, INC
Wallace
Pres & Gen Mgr: W M Yeaman
VP: Ray Morrison
Sec & Treas: A H Featherstone, Wallace
SILVER SYNDICATE MINE, 10 mi from Wallace, shaft, Au, Cu, Pb, Zn, Ag
Operated by Sunshine Mining Co, which see

J R SIMPLOT COMPANY, FLUORSPAR MINE INC
c/o Keith Madill, Challis
Pres: J R Simplot
VP: Grant Kilbourne
Sec Treas: John Dahl
Gen Mgr: Keith Madill
Purch Agt: Austin Richins
FLUORSPAR MINE, Challis, underground
Also see Nevada listing

SIMPLOT FERTILIZER CO
Box 912, Pocatello
Pres: J R Simplot
Gen Mgr: E W Hansen
VP: Grant Kilbourne
Sec Treas: John Dahl
Purch Agt: Austin Richins
GAY MINE, 22 mi from Fort Hall, open-pit, Phosphate
Mgr: John Kobe
Mine Supt: Charles W Sweetwood
Engr: Maurice Hansen
Geol: Charles A Lee
300-TON SUPERPHOSPHATE PL producing P_2O_5
300,000 tons prod annually
Pl Supt: William Tinto

SNOOSE MINING CO
Box 67, Hailey
Pres & Gen Mgr: A M Jensen
VP: W F Smith, Wendover, Nev
Sec-Treas: R S Bacon, Twin Falls
SNOOSE MINE, 2 1/2 mi SE of Hailey, Zn, Pb, Ag, Au, shaft & adit under dev

SOUTH FORK PLACERS
Ten Mile district, Idaho Co
c/o Carl McHargue, Golden, Idaho
Au

SPOKANE - IDAHO MINING CO
611 Peyton Bldg, Spokane 8 Washington
Pres: Frank N Marr
VP: S H Clinedinst
Gen Mgr, Purch Agt: J C Kieffer
Treas: Charles E M arr, Jr
Chief Engr: R G Gordon
CONSTITUTION MINE, Kellogg, Box 930, 8 1/2 mi SE of Pinehurst, Zn, Pb, Ag shaft
Mine Supt: C F Redding
Engr: George McCall
Elect Engr: Emery F Fiscuss
180-TON FLOT MILL
Mill Supt: Norman Arneson
Met: D O Skiles
Smelter, Pb, Zn,
20,000,000 lbs yearly

SQUARE PEAK MINE
25 mi N of McCall
Partners: F B Frasier, L L Frasier
R J Frasier & A R Roger
Au, Pb, Zn, Ag, W, Cu
Supt & Mgr: G W Frasier, Weiser

STITES & CO
Box 766, McCall
Gen Mgr: B M Stites
Dir: Clifford E Enger, Austin, Minn
LUCILE PLACERS, dragline dredge, Au, Ag
Engr: Walter Hovey Hill

STOKES & SHOUP, KYANITE EXPLORATION
Box 756, Salmon
Gen Mgr: G E Shoup
Asst Mgr: Earl Stokes
SPARK PLUG LODES, 5 mi W of Salmon
Kyanite (Strategic highgrade)
open-pit

STRUNK, ETHEL MAY
Custer County, Alder Creek dist
HORSESHOE MINE
Leeses: D A Anderson, A G Anderson & C B Lindburg

SUCCESS MINING CO
Wallace
Pres: Henry L Day
SUCCESS MINE, Wallace, Zn, Pb, Ag, Sb
Irregular lessee operation

SULLIVAN MINING CO
Box 320, Wallace
Pres: S A Easton
VP & Mine Mgr: A W Witherspoon
Sec: Ira A Robson
Treas: L J Randall
Mine Purch Agt: R G Hill
STAR MINE, Burke, shaft, Au, Pb, Ag
Supt: R W Neyman
Foreman: Lee Messerly
Engr: R E Sorenson
STAR FLOT MILL, Burke, 950 tons daily
Supt: N J Sather
Foreman: Robert Miller
ELECTROLYTIC ZINC PL, Silver King
Mgr: J B Haffner
Purch Agt: Henry Biotti
Supt: W G Woolf
4800 tons monthly

SUNSET LEASE
Day Bldg, Wallace
Gen Supt: R Farmin
SUNSET MINE, 10 mi N of Wallace, underground, Zn, Pb

SUNSET MINERALS, INC
Box 869, Kellogg
Pres: O Bardahl
VP & Gen Mgr: Bliss Moore
Sec Treas: David Harvey
LIBERAL KING, 11 mi W of Kellogg, Zn, Pb, Ag, Au, vein mined by shaft, adit, 100 tons daily
IDAHO GROUP, 17 mi SW of Kellogg, Pb, Ag, Zn, 30 tons daily
Mine Supt: R E Lomas
Engr: J T McDonald
Geol: G E Gillingham
100-TON FLOT MILL
Supt: W E Hall

SUNSHINE CONSOLIDATED, INC
Sidney Bldg, Kellogg
Pres: W M Yeaman
VP: W T Simons
Sec: F E Marler, Jr
Gen Mgr: N M Smith
SUNSHINE CONSOLIDATED MINE, 6 mi E of Kellogg, cut-and-fill and shrinkage stoping operations
(Under dev by Sunshine Mining Co.)

SUNSHINE MINING CO
Box 1080, Kellogg
Pres: Robert M Hardy
Gen Mgr: Ross D Leisk
Gen Supt: John Edgar
Directors: Joshua Green & C M Hull
Asst Treas: Robert M Hardy Jr
Purch Agt: N J Osborne
SUNSHINE MINE, 5 mi E of Kellogg, Evolution dist, underground, Ag, Pb, Cu
Gen Supt: John Edgar
Engr: R L Anderson
Geol: R F Robinson
Foreman: Charles Angle
1400-TON FLOT MILL
Supt: Wayne D Gould
Assay: M F Scott
SILVER SYNDICATE MINE
(See Silver Syndicate Mng Co)
SUN SHINE CONS MINE

SUNSHINE PLACER
c/o Sapps Grocery, Lewiston
Mgr: C R Williams
PLACER, Idaho Co

SUN VALLEY LEAD-SILVER MINES, INC, Box 57, Ketchum
Pres: R L Roundy
Sec Treas: J R Thornton
BLUE KITTEN MINE, 8 mi W of Ketchum, Pb, Zn, Ag, Au, dev
Foreman: F W Lease
100-TON FLOT MILL, 5 mi W of Ketchum
Supt: H A Stamer

TALACHE MINES, INC
211 Yates Bldg, Boise
Pres: A H Burroughs, Jr
VP: B K Burroughs
BOISE-ROCHESTER & MONARCH MINES, Atlanta, undgrnd, Au, Ag
Gen Supt: P T Peterson
Elec: H A Hartman
350-TON FLOT MILL
Supt: J N Groomer
LONE PINE MINE, Idaho dist, Ag, Pb, Zn
(Leased to Lone Pine Mng Co)

TAYLOR, IVAN T
Box 416, Mackay
SKYVIEW #1, 2, Alder Cr dist

TRIUMPH MINING CO
Triumph
Pres: J W Swent
Gen Mgr: A H Shoemaker
Purch Agt: Herbert Shear
MINE, Triumph, underground, Au, Ag, Cu, Pb, Zn
Supt: L M Robinson
Engr: C C Livingston
Foreman: Rupert House
200-TON FLOT MILL
Supt: M A Jorgensen
Assay: A L Hall

TUCKER, MRS BESSIE F
4206 Leimart Bldg, Los Angeles, Calif
RIPPETO MINE, Blaine Co, Ag, Pb, Zn
(Leased to Rod McKay, Muldoon)

TURTLE MINE
Mackay
Mgr: Leo D Ivie
MINE, Custer Co, Bayhorse dist

TYEE MINING CO
Spokane St Dock, Seattle, Wash
MINE, Elk City, Au, Ag, dragline, dredge
Gen Mgr: C J Sebastian
Supt: S K Coates

UNITED MERCURY MINES CO
246 Sonna Bldg, Boise
Pres & Gen Mgr: J J Oberbillig
MINE, Yellow Pine, Au, Ag, Sb, Wo, Hg
120-TON FURN

UNITED MINERALS RESERVE
518 Felt Bldg, Salt Lake City, Utah
(See Utah listing)
HOMESTAKE-LONG GRADE MINE, Ketchum, Zn, Pb, Ag, Au, Cu, adit
Supt: Albert Savaria
(Also see Nev & Ariz listings)

UTAH-IDAHO MNG & MLG CO
Paris
Pres & Gen Mgr: P C O'Malley
MINE, near Paris, Pb, Cu, Ag, Au
Under dev

VERDE MAY MNG CO, LTD
Wallace
Pres & Gen Mgr: G W Nordquist
VP & Sec: W H Hanson
MINE, Gem, Pb, Ag, dev

VINDICATOR SILVER-LEAD MINING CO, Box 469, Wallace
Pres: H J Rossi
VP: H W Ingalls
Sec Treas: H F Magnuson
VINDICATOR MINE, 2 mi E of Mullan
Engr: Arthur Lakes

WARREN DREDGING CORP
Centerville
Sec Treas: G T Eyman
BULLOCK & GOLDEN ROD GROUPS, Idaho Co, bucket dredge, Au, Ag

WASHINGTON MINING CO
Pres: John C Glabe
MINE, Burke, Zn, Ag, Pb, idle
Gen Mgr: Mark Evans

WEBER MINE
Athol
MINE, Bonner Co, Au, Ag, Pb, Cu

WESTERN METAL PROD CO
Wardner
Pres: W R Brainard
Mgr: R L Brainard
MINE, near Murray, Eagle dist, Ag, Pb, idle

WHITEDELF MNG & DEV CO
Clark Fork
Pres & Gen Mgr: C I White Jr
Sec Treas: C I White Sr
WHITEDELF MINE, on Clark Fork, shaft, adit, Ag, Pb, Zn
50-TON FLOT MILL
Supt: G J Rose

WHITE KNOB MINING CO
Newhouse Bldg, Salt Lake City, Utah
Pres: W C Page
MINE, Alder Cr, Mackay, Pb, Zn

WICKSTROM, GEORGE
Raymond, Wash
GOLDEN RULE MINE, 40 mi N of McCall, placer Au, Ag
Prod: 20,000 yds

WILBERT MINING CO
316 Kearns Blg, Salt Lake City, Utah
Pres: F B Cook
VP: R J Hogan
Sec: O C Larson
DAISY BLACK GROUP, Dome dist, Howe, Pb, Ag, idle
75-TON CONC

WILLIAMS, HARRY M
Box 761, Caldwell
VALLEY VIEW MINE

WONDER LODE CLAIMS, INC
Box 756, Salmon
Pres & Mgr: Elmo Shoup
Gen Mgr: R M Shoup
WONDER LODE CLAIMS, IDAHO PRIDE GROUP, BUFFALO LODE CLAIMS, underground & open pit, Cu, Ag, Au
Rare Earths

WONDER MINING CO
Golden
Mgr: Ernest Butler
MINE, Idaho Co, 10-Mi dist, Au, Ag

YANKEE MINES, INC
3417 Nez Perce, Boise
Pres & Gen Mgr: C E Reasnyder
VP: Howell J Layson
Sec: Troy Becker
LUCKY BOY, CUSTER & MULLEN GROUPS, Sunbeam, undgrnd, Au, Ag
100-TON FLOT MILL
(Leased by Chas H Heisen)

MONTANA

A 1 CON MNG & ENG CO
Sheridan
MINE, Peterson Gulch, Ag, Cu
Engr: M R Massey

ALICE MINE
Walkerville
Operator: Remo Fantini
MINE, Silver Bow Co, Ag, Pb, Zn

ALLEN, HARRY
Box 282, Townsend
SPAR MINE, Broadwater Co, Ag

ALLIED METALS, INC
418 Sprague Ave, Spokane, Wash
Pres: Wm Tanke
VP: Frank Mangis
Gen Mgr: J F Arnold
SYLVIA MINE, Wisdom, Au, Ag, Cu, Pb Zn, Mn, placer & underground
Engr: A C Arnold

ALPS MNG & MLG CO
Box 1364, Missoula
Pres: J F Smith
VP: Ed Schrieber
Sec Treas: R T Stegner
ALPS MINE & ARGO MINE, 22 mi SW of Clinton, adit, W, Au, Ag
150-TON GRAV FLOT MILL, Brewster

AMAZON MINING CO
Box 372, Coeur D'Alene, Idaho
Pres: A E Lunden
Sec Treas: Geo M Servick
MINE, Near Heron, Au, Ag, Cu, dev
Mont Agt: Jos Brooks, Noxon

AMBASSADOR MINES CORP
416 Empire State Bldg, Spokane, Wash
Pres & Gen Mgr: M J Unger
VP: Dale Lanphere
Sec Treas: E I Fisher
AMBASSADOR MINE, 10 mi SW of Trout Cr, Box 45, undergrnd, Au, Ag, Pb, Cu

AMERICAN ALLOY METALS
1 Montgomery St, San Francisco, Calif
Pres: E A Julian
VP & Gen Mgr: Frank Eichelberger
Sec Treas: Willis Swan
BROWN'S LAKE MINE, 8 mi W of Glen, under dev, W
IVANHOE MINE, 30 mi W of Dillon, underground, W, Cu, Ag
(Leased from Greenstone Copper Mine)

AMERICAN GOLD CORP
Box 137, Pony
Pres: H E Boon
Gen Mgr: J F Kitching
BOSS TEEL-CLIPPER & ALLIED GROUPS, Pony, Au, Ag, dev

AMERICAN MACHINE & METALS
(See North Eastern listing)
TROUT MINING DIVISION
Trout, Algonquin Group, 2 mi E of Philippsburg, Mn, Ag, Pb, Zn
Mgr & Purch Agt: L B Manning
Supt: Roy McLeod
Foreman: Thomas Purtle
100-TON FLOT MILL, 75-TON GRAV MAGNETIC MILL
Supt: Roy V Hamilton

AMERICAN SMELTING & REFINING CO, (See North Eastern)
JACK WAITE MINE, Sanders Co, Pb, Zn
Mgr: J E Berg
EAST HELENA PL, East Helena
Custom Lead Smelter
Mgr: Kuno Doerr, Jr
(Also see Mike Horse Mng & Mlg Co)

ANACONDA COPPER MNG CO
(See Northeastern listing)
Butte
MINING OPERATIONS, complex veins carrying Cu, Zn, Mn, Pb, Ag, As, dev by shafts with square-set, cut-fill, and block caving
VP Chg Western Oper: E S McGlone
Admins, Consultant: D M Kelly
Assts to VP: F A Linforth, J H Dickey
Asst Sec Treas: K B Frazer
Asst Sec & Asst to VP: J D Murphy
Mgr of Mines: E I Renouard, Jr
Cons Geol: R H Sales
Asst Ch Geol, N America: M H Gidel
Ch Geol, Butte: C H Steele
Ch Mng Engr: W A O'Kelly
Ch Sampler: P K Ramsay
Ch Research Engr: E R Borcherdt
Asst Research Engr: L F Bishop
Ch Mech Engr: R J Kennard
Mech Supt: F C Jaccard
Asst Mech Supt: George Lily
Elec Supt: I H Steck
Ch Bureau of Saftey: J L Boardman
Ch Ventilation Engr: A S Richardson
Labor Commissioner: Eugene Hogan
Asst Traffic Mgr: W P Coughlin
Ch Assay: W C Gallagher
Supt, Washoe Sampler: L R Margetts
Fire Drilling Fore: Ed Bonner
Diamond drills & material fore: C S Mathews
BELMONT, TRAVONA, ORPHAN GIRL, STEWARD, ORIGINAL, ST LAWRENCE, & HIGH ORE MINES
Asst Gen Supt: T H Oaas
Belmont Supt: H Gillis
Travona Foreman: S Hurley
Orphan Girl Foreman: J Geach
High Ore Foreman: John Scott
MT CON & ANSELMO MINES
Asst Gen Supt: W R Russert
Mt Con Supt: V D O'Leary
Anselmo Supt: San Meatherly
LEONARD & TRAMWAY MINES
Asst Gen Supt: Hale Storck
Leonard Supt: Russell Powell
Tramway Foreman: Wm Trudeau
BADGER STATE, ALICE, LEXINGTON, & EMMA MINES
Asst Gen Supt: A R Sims
Emma Supt: J Flynn
Lexington Foreman: R Lahiff
KELLEY MINE
Asst Gen Supt: Martin Hannifan
Kelley Supt: John Killoy
COPPER PRECIPITATING PLANT
Foreman: J P Ryan
ANACONDA REDUCTION WORKS, Anaconda
Mgr: W E Mitchell
Asst Mgr: C A Lemmon
Gen Supt: E A Barnard
Research Engr: F F Frick
Asst Research Engr: F L Holderreed
Testing Engr: T G Fulmor
Met: R G Bowman
Ch Chem: C H Gutchell
Asst Ch Chem: C M Lagergren
Mech Supt: L E Larsen
Elec Supt: R P McCarren
Const Supt: H F Morris
Ch Draftsman: E P Dimock
Supt, Slag & Tailings: W F Flynn
Asst Supt, Slag & Tailings: J A Grant
Supt, Tramming & Weighing: I C Gnose
Asst Supt, Tramming & Weighing: B E Westgaard
Supt, Surface Dept: W K Smith
Ch Clk: D R Nelson
COPPER CONC, 19,000 tons
ZINC CONC, 4,000 tons
MANGANESE CONC, 1,550 tons
Supt: C F Milkwick
Asst Supts: R A Reoder, T J Fisher, B T McDonald
COPPER SMELTER, 150,000 tons yr
Supt: J H Maguire
Asst Supt: J H McCrea
Supt of Roasters: F A Salomonson
ZINC PLANT, Electrolytic, 72,000 tons yearly
Supts: W A Emanuel, C M Holstrom, K G Sweeney
PHOSPHATE PLANT, 100,000 tons yr
Supt: M C Messner
Asst Supts: K F Ruckwardt, O C Finkelnburg
ACID PLANTS, H_2SO_4, 415 tons
Supt: M R Hoyt
Asst Supt: W W Harrity
MANGANESE NODULIZING PLANT, 380 long-tons
Supt: F Cole
FERROMANGANESE PLANT, 2,500 long-tons monthly
Supt: J R Moore
Asst Supt: E S Kramlick
DUST TREATING PLANTS
Supt: J J Dougherty
GREAT FALLS REDUCTION WORKS, Great Falls
Mgr: R B Caples
Gen Supt: F S Weimer
Asst Gen Supt: H G Satterthwaite
Tech Cons: E S Bardwell
Mech Supt: J W Porter
Met: R J Lapee
Ch Clk: W F Sneddon
FURN COPPER REFINERY, 180,00 tons yearly
ELEC COPPER REFINERY, 150,000 tons yearly
Supt: R H Miller
Asst Supt: J F Smith
ELEC ZINC REFINERY, 160,000 tons yearly
Supt: R K Graham
Asst Supt: G T Weaver
ELEC FERROMANGANESE FURN, 525 long-tons monthly
Supt: M J Villeneuve
SLAG FUMING PLANT, East Helena, 250,000 tons yearly
Supt: E M Baldwin
Asst Supt: R L Thompson

ANDERSON BROS
Lewistown
BLUE DICK MINE, Warm Springs dist, Fergus Co, Cu

ANDERSON PHOSPHATE MINES
303 O'Rourke Estate Bldg, Butte
Pres: Wm Anderson
Gen Mgr: Wm Anderson Jr
Sec Treas: G D Anderson
MELROSE MINE, Phosphate
Engr: H F Johnson

ANTONIOLI, PETER
SILVER PRINCE MINE, Granite Co, Ag

AURORA MINING CO
228 Rialto Bldg, Butte
Gen Mgr: Don Keith
AURORA MINE, 3 mi NW of Basin, underground, Pb, Zn, Ag, dev
Foreman: Don Keith

BAILEY, R L
Wagner
GOLD, SILVER, WAR & Other Mines, 40 mi SW of Malta, Au, Ag, Pb, dev

BARNES, O A
900 W Main, Helena
CASWELL PLACER, Lewis & Clark Co, dragline dredge, Au

BENNETT MINING CO
Box 1135, Great Falls
Pres: Carroll R Bennett
Gen Mgr & Purch Agt: F B Clarke
DACOTAH MINE, Neihart, underground, Zn, Pb, Ag, Au
FLOT MILL

BIG EIGHT MINE
Troy
Mgr: Ed McCaffery
MINE, 8 mi from Troy, Zn, Pb, Ag

BLACK & WHITE MNG CO
331 N Ave West, Missoula
Pres & Gen Mgr: R F Little
BROOKLYN MINE, Maxville, Ag, Pb, Zn, dev
(Leased to Saranac Mng Co)

BLUE BIRD MINE
Corbin, via Jefferson City
Owner: A F Bell
BLUE BIRD MINE, 4 mi W of Wickes, underground, Au, Ag, Cu, Pb, dev

BOAZ LEASING CO
Dillon
Trustee: A J Theis
SHAFER BROS MINE, 21 mi N of Dillon, underground, Ag, Au
Engr: E W Stevens
Supt: Charlie Pritchet

BRANDON GOLD FIELDS, INC
1216 Newark Ave, Spokane, Wash
Pres: S A Morford
Sec Treas: Jack Brandon
MINE, 33 mi from Superior, dev

BRENNER, CHARLES
PLACER on Colo Cr, Horse Prairie dist, Beaverhead Co, Au

BULS MINING CO
1001 E Broadway, Missoula
Pres & Gen Mgr: C F Buls
St Lawrence Mine, Saltese, underground, Ag, Cu, dev

BUTTE COPPER CONS MINES
505 Montana Standrd Bldg, Butte
Pres: C J Trauerman
JO DANDY GROUP, Radersburg, Ag, Pb

BUTTE COPPER & ZINC CO
25 Broad St, New York, N Y
Pres: A A Shelare
VP: M F McDonald
Sec: J F Cole
EMMA MINE GROUP, 203 Lewisohn Bldg, Butte, underground, Mn, Zn, Pb, Au, Ag
Engr: Samuel Barkerm Jr

CANUSCO, INC
Huson
Pres: R H Pooley
VP: R C Dempster
Sec Treas: E V Dempster
MINE, Huson, Au, dragline dredge
Supt: R P Wells
CARBONATE MINE, Whthall dist, Pb
Operator: Lester Lindquist

CANYON LODE MNG CO
425 Edith St, Missoula
Pres: R R Wallace
CABLE MINE, Cable Rd, Anaconda underground, placer, Au, Cu
Engr: W T Holser
Mech Engr: Elvier Oehrling
100-TON FLOT MILL
Supt: Frank Metler

CARBONATE MINES, INC
Marysville
Mgr: Maurice Lawlor
BALD BUTTE MINE, Underground, near Marysville, Pb, Ag, dev
CARBONATE MINE, underground near Marysville, Pb, Ag, dev

CASTLE, HARRY
Winston
BELMONT MINE, Lewis & Clark Co, Au

COEUR D'ALENE EXT MINES
Wallace, Idaho
MINE, Superior, Fluorspar
Mgr: James E Scott

COLORADO MINE
535 E Mercury St, Butte
Operator: Nick Vujovich
MINE, Summit Valley dist, Ag

COMMONWEALTH LEAD MNG
424 Felt Bldg, Salt Lake City, Utah
Pres: J F Featherstone
Sec Treas: D R Featherstone
CALVIN MINE, Melrose, underground, Au, Ag, Pb, Zn
Engr: R E Marsell
Foreman: R J Hirst

CORNUCOPIA MINES CO
Virginia City
MINE, Virginia City dist, underground, Au
Mgr: Henry Shute

CRITCHFIELD, RAYMOND
Box 332, Whitehall
PARROTT MINE, 4 mi NE of Whitehall, underground, Au, Ag, idle

CRUMB, RAY W
Avon
HUMDINGER MINE, Avon, adit, Au, Ag
4-TON GRAV MILL

CUMBERLAND MINES
White Sulphur Springs
Pres: Russell Manger
VP: Richard Manger
CUMBERLAND MINE, 8 mi from Lennep, Pb, Ag, Zn

DALE, C O & SONS
Twin Bridges
POLLY JANE MINE, Madison Co, Pb

DAVIS, RALPH E
1434 Commerce Bldg, Houston, Tex
PLACERS, Barton Gulch, Box C Alder, hydraulic dragline
Mgr: Russell Unrue

DIADEM MINING CO
419 Sprague Ave, Spokane, Wash
Pres & Gen Mgr: J F Arnold
VP: F L Carpenter
DIADEM MINE, 6 mi SE of Wilson, shaft, adit, Au, Ag, Cu, Pb, Zn, Mn, Sb
Engr: A C Arnold

DIXON COPPER CO
Ronan
Pres: Ed Broholm
Sec Treas: R T Maxwell
BLUE OX CLAIMS, 6 mi SW of Dixon, Au, Cu, dev

DOMESTIC MANGANESE & DEV
S Mont St, Butte
Pres: J H Cole
VP: H A Pumpelly
Sec: Katherine Keith
Treas: Elizabeth Cole
300-TON FLOT MILL with nodulizing pl for rhodocrosite

DOUBLE EAGLE TUNGSTEN CO
Box K, Philipsburg
Pres & Gen Mgr: W R McLure
VP: E T Irvine
Sec Treas: W L Degenhart
DOUBLE EAGLE MINE, 12 mi NW of Philipsburg, W, Cu, Pb, Ag
Shiftboss: C D McLure

DOUGLAS PLACERS
420 Woodford St, Missoula
Owner: A R Douglas
PLACER, Near Townsend, Au dev

DRACKERT & FLINT
Pony
OLD JOE WEST EXT MINE, Au, idle

EAST PACIFIC MINE
Winston
Owner: H Carver
MINE, 6 mi SW of Winston, Ag, Pb, Zn

ELDORADO MINING CO
333 Clark St, Helena
Pres: O W Pollard
ELDORADO MINE, 12 mi N of Avon, underground, Cu, Au, Ag
30-TON FLOT MILL

ELKHORN MINING CO
Boulder Bank Bldg, Boulder
Pres & Gen Mgr: W V Lewis
VP: W S Doyle
Sec Treas: J T Lewis
ELKHORN, FREE ENTERPRISE, 49er, & LAST CHANCE MINES, underground, Pb, Ag, Zn, Au, U, Th & rare earths
Foreman: W B Smith
Engr: Wade V Lewis

ELLISTON CONS MINING CO
Elliston
Pres & Gen Mgr: L T Newman
VP: C L Helgren
Sec: D E Newman
Treas: Victor Frost
LILLY GROUP MINES, 10 mi S of Elliston, Pb, Zn, Au, Ag, Cu

F M S MINING CO
Garnet
Dirs: Faulkner, Ormesher & Sutherland, Missoula
MITCHELL-MUSSIGBROD MINE & DUMPS, Garnet, Au, dev

FAITHFUL GOLD MINING CO
Dillon
Gen Mgr & Purch Agt: D V Erwin
FAITHFUL GOLD, ALICE LEAD & BADGER GOLD MINES, Dillon, Ag, Au, Pb

FLINT, JAMES A & SONS
Bank Bldg, Pony
LOUISIANA, CHILE, AMY LOUISE, & Others, Madison Co, Au, Ag, W, Cu
TUNGSTEN GROUP, 12 mi S of Pony, underground, open pit, W
MINING STATES GROUP, W

FLORENCE COMPANY
505 Montana Standard Bldg, Butte
Pres: A D Rieder
VP: Mary Rieder
Sec: C J Trauerman
MINUTE MAN GROUP, 5 mi SE of Neihart, Pb, Zn, Cu, Ag, idle

GARRISON MINING CO
Virginia City
Mgr: Rupert Garrison
GARRISON MINE, Madison Co, Au

GEYSER GYPSUM CO
Geyser
Dirs: Storm, McKay & Martin

GIANT MLG & DEV CO
Helena
Principals: Pugh, Dick & Martin

GILDERSLEEVE BROS MINES
Superior
Gen Mgr: G M Gildersleeve
BONANZA GROUP QUARTZ & STEWINDER PLACER MINE, 17 mi S of Superior, underground & placer, idle
Pb, Ag, Cu, Au

GIRDS CREEK VERMICULITE PRODUCTS CO, Box 369, Hamilton
Pres: Robert Chamberlain
Sec: E G Brownlee
VP: Cliff Jacobson
BITTER ROOT MINE, 11 mi E of Hamilton, Vermiculite
EXFOLIATION PL, Hamilton

GOLCONDA MNG CO, INC
15 Pittsburg Blk, Helena
Pres: M I Leydig
Sec: C P Whitcomb
BUCKEYE GROUP, 7 mi SE of Jefferson City, Au, Ag, Pb
100-TON CYANIDE CONC MILL

GOLDEN, B L
Sheridan
BILLY BENNETT MINE, 9 mi N of Sheridan, underground, idle

GOLDEN ANCHOR MNG & MLG
Spokane, Wash
Pres: H L Newmiller
VP: C F Davis
Sec: Helen Newmiller
EVENING STAR & BLACK JACK MINES, Near Elliston, Au, Ag, Pb

GRANT-JOHNSON MINE
267 Second Ave, NE, Kalispell
MINE, Hog Heaven dist, Au, Ag, Cu
dozer & tunnel operations dev

GREEN MOUNTAIN MNG CO
Dixon
Pres: C E Dragstedt
VP: H W Rock
Sec Treas: E F Elstone
GREEN MT MINE, 6 mi SW of Dixon, Sanders Co, Cu, Au, Pt, Ag
50-TON FLOT MILL

GREENSTONE COPPER MINE
Box 421, Dillon
Pres: G W Farlin
Sec Treas: Grace E Kennedy
Gen Mgr: Carl Kennedy
GREENSTONE MINE, 18 mi NW of Dillon, shaft, adit, open pit, W, Cu, Ag, Au, (Open pit operations leased to Minerals Engineering Co of Colo)
IVANHOE MINE, 30 mi NW of Dillon, underground, W, Cu, Ag, (Leased to American Metals Alloy Co)

H & H COMPANY
Lewistown
Pres: J H Hughes
VP & Gen Mgr: B E Hine
Sec Treas: J T Birdston
TIONESTA & DOODLEBUG GROUPS, 60 mi NW of Lewistown, Au placer

HARVEY MACHINE CO, INC
Helena
Pres: L M Harvey, Torrance, Calif
ALUMINUM PROCESSING PL near Hungry Horse Dam, Kalispell, under const by Anaconda

HEADS & TAILS MNG, MLG & LUMBER CO, INC, Butte
Owners: Dunn, Lloyd, Pomeroy, Kellog, & Dwyer

HI-RIDGE MINE
Twin Bridges
Owner: J C Roberts
MINE, 6 mi E of Twin Bridges, Au, Ag
Mgr: James P Reed

HOKANSON BROS
Box 34, Norris
Operators: G E & Fred Hokanson
PEARL GROUP, 7 mi SW of Norris, Au, Ag, Pb, shaft, dev

HUNT MINING CO, INC
Box 65, Laurin
Pres: M Z Hunt
Gen Mgr: A E Hunt
BINS, GOLD NUGGET, BULL RUN & CALIFORNIA GROUPS, Laurin, underground, open pit, placer, Au, Ag, Pb
Foreman: Toney Ravona
Mech Engr: Elbert Pack
GRAV FLOT MILL, 25-ton furn
Foreman: Karl Caldwell

INTERNATIONAL MINERALS & CHEMICAL CORP
(See North Central listing)
PHOSPHATE MINES & PL, Drummond

INTERSTATE MFG CO
Bozeman
PROPERTY near Gallatin Gateway, Asbestos
Pres: C W Lester

JANUARY MINING CO
414 Flowerree St, Helena
Pres & Gen Mgr: G E Neil
JANUARY MINE, Winston, Au, Ag, Cu, Pb, Zn

JARDINE MINING CO
Jardine
VP & Gen Mgr: G T Vandel
Purch Agt: E L Conn
MINE, undgrnd, open pit, Au, W
Supt: B F Onstott
350-TON CYANIDE FLOT MILL

JUPITER MINING CO
Day Bldg, Box 1010, Wallace
Pres: H L Day
Sec Treas: R W Anno
MINE, near Saltese, underground, Pb, Ag, Cu, dev

KOOTENAY COPPER MINES
425 Edith St, Missoula
Pres & Gen Mgr: E F Elstone
VP: R E Akin
Sec: H C Fisher
GREEN MT MINE, 6 mi SW of Dixon, Cu, Au, Pt, Pa, Ag, dev
Supt: S J Giulio
50-TON MILL, at mine

LAHEY, ED
Butte
MINE, open pit, Alta, Ag, Pb

LANTIS, G D
Lincoln
BIG ROCKS PLACER, 9 mi SW of Lincoln, Au
LADY LUCK PLACER, 7 mi SW of Lincoln, dev

LARSON, GEO L
545 5th Ave, Helena
LARSON MINE, Lewis & Clark Co, Ag

LEHMAN, WALTER
Box 780, Lewistown
SIR WALTER SCOTT MINE, 67 mi W of Lewistown, open pit, Ag, Pb, Cu, dev

LIBBY GOLD CORP
745 Peyton Bldg, Spokane, Wash
Prs: J W Doughty
VP: S S Schuette
Sec Treas: R P Woodworth
Mgn Dir: Barth Keneily
LIBBY GOLD MINE, 6 mi from Libby, Ag, Au, Pb, dev

LIBERTY MONTANA MINES CO
Jefferson Island
Pres: W D Corrigan Sr
MAMMOTH MINE, Madison Co, Au, Ag, Cu
Gen Mgr: A J MacGregor
150-TON FLOT MILL, idle

LINTON MINES
Missoula Hotel, Missoula
Gen Mgr: T J Linton
BLACKTAIN MINE, 25 mi E of Missoula, shaft, Pb, 150 tons
Fore: Ralph Mellor
Engr: Frank Mitchell
HMS MILL, 500 tons
Fore: Walter Chandler

LOUIS PHILIPE MINE
Dillon
Owner: I B Hand
Mgr: John Hand
MINE, underground, Au, Ag, Pb
Engr: Bill Hand

LUCKY HIT MINE
Whitehall
Owner: G W Wolge
MINE, Jefferson Co, Cu, Pb, Zn, dev

M & S MINING CO, INC
Virginia City
MARIETTA & SNOWDRIFT CLAIMS, Virginia City dist

MAGNA CHARTA MINE
Walkerville
Operator: Michael Rakish
MINE, Summit Valley dist, Ag

MANGER, RUSSELL & RICHARD
White Sulphur Springs
SNOW BANK, PORCUPINE & BOURBON MINES, 18-22 mi from White Sulphur Springs, shaft, adit, Au, Ag, SiO_2
15-TON GRAV MILL

MARIETTA MINES
Box 20, Townsend
MINES, 17 mi NW of Townsend in Park mng dist, Au, Ag, Pb, Zn
Mgr: Al Dance
Supt: Harry Anders

MARTIN MINING CO
Kalispell
Prs: Hans Tutvedt
VP: Ben Schlegel
Sec Treas: T R Flynn
MINE, Flathead Co, underground, Ag, Pb, Cu, Zn
Supt: Waino Linbom
60-TON MILL

MASTER MINING CO
6323 Avondale Ave, Chicago, Ill
Pres: O L Rhoades
MINE, Gold Creek, Au, dragline dredge
Mgr: J H McIntosh

MAUDLIN MINE
Beaverhead County
Operator: John Hand
MINE, Argenta dist, Pb, Ag

MAYWOOD, MRS G A
Box 45, Palm City, Calif
MONTANA-TONEPAH MINE, 5 mi E of Maxville, placer, idle

McLAREN GOLD MINES CO
c/o C G Grimes, Dayton, Ohio
Pres: Owen B Jones
Gen Mgr: S H Hisle
MINE, Cooke, open pit, Au, Ag, Cu
Foreman: C O Owens
200-TON FLOT MILL
Supt: H E Graves
Assay: C T Delude

McLAUGHLIN BROS
Stevensville
Gen Mgr: Carl C McLaughlin
JACK RABBIT MINE, 7 mi E of Melrose shaft, Pb, Ag, Au, idle

McLEOD, W C
Box 588, Dillon
GOLDEN LEAF MINE, Beaverhead Co, placer, dragline & washing pl, Au, idle

MERRILL MINE
Box 184, Libby
Owner: Amzel Templin
MINE, Au, Ag, Pb, Zn, dev
20-TON FLOT MILL

METALS MILLING CO, INC
Basin
Prs: B H Linn
Sec: Will Derig
Treas: Roy Brennon
Gen Mgr: John MacGinniss
130-TON CUSTOM MILL, flot, Pb, Zn, Ag, Au
Supt: Frank Soll
Met: A J Turk
Elec Engr: Pete Brady

MIKE HORSE MNG & MLG CO
Mike Horse
Gen Mgr: J E Berg, Wallace
MIKE HORSE MINE, 53 mi NW of Helena shaft, adit, Pb, Zn, Ag
Gen Supt: A E Haeseler
Supt: N Thomson
Ch Clk: G W Moad
200-TON FLOT MILL
Supt: R A Blake

MILLER, JACK, MINE
P O Box 333, Drummond
Gen Mgr: W A Noon
MINE, Au, Ag, Pb, dev

MINAH DEVELOPMENT CO
Butte
Mgr: A E Nugent
MATSON & NORTH ALTA GROUPS, Jefferson Co, dev

MINERAL KING MINING CO
1001 E Broadway, Missoula
Pres & Gen Mgr: C F Buls
MINERAL KING MINE, Saltese, underground, open pit, Au, Ag, Pb, Zn, Fe
Engr: Ellstone

MINERVA MINE
Whitehall
Operator: T Davenport
MINE, Whitehall dist, Au, Ag, Cu, Pb, Zn

MINMONT MINING CO
Box 812, Helena
Pres: G J Johnson
Sec: R H Kurth
Gen Mgr: Herb Carver
EAST PACIFIC MINE, 5 mi W of Winston underground, Pb, Zn
OWNS KLEINSCHMIDT MINE
Operator: C L Hewitt

MITCHELL, C B
Helena
PLACER LEASE, Helena, Au

MITCHELL MINING CO
212 Union Bldg, Mt Vernon, Wash
Pres & Gen Mgr: E B Olmstead
VP: L M Peck
Sec: Walter Hartwick
Treas: A C Pelland

MARGET MINE, 2 mi N of Butte, shaft, Ag, Mn, Au, Zn, Pb
Supt: Maurice Turner
Geol & Engr: Roy Hammond

MONTANA CLAY, INC
Townsend
MINE, Townsend, Clay, Gravel

MONTANA GRAPHITE, INC
Box 311, Bozeman
Gen Mgr: M F Riebhoff
CRYSTAL GRAPHITE MINE, 13 mi SE of Dillon, Graphite
Mgr: L W Robison
125-TON FLOT MILL
Assay: Doran Cunningham

MONTANA PHOSPHATE PROD
Garrison
Pres: R B Shelledy
ANDERSON MINE, 11 mi NW of Garrison
GRAVELEY & LUKE MINES, 9 mi NW of Avon, shafts, Phosphate rock
Supt: F E Burnet
Asst Supt: J J McKay
Foreman: C R McDonald
Engr: C Noon

MONTANA RAINBOW MNG CO
Marysville
Owner: W R Wade
Gen Supt: John Brophy
DRUMLUMMON MINE, undgrnd, Au, Ag
Supt: Gerald Hartley

MONTANA RESEARCH FND
Box 85, Basin
Pres: Gov Hauser
SILVERSIDE & HELPER CLAIMS, Au, Ag, Pb, Zn
Supt: E L Craddock
Engr: M H MacGinniss

MORNING GLORY MINES, INC
1429 Old Nat'l Bank Bldg, Spokane
Pres: H F Tabb
Sec Treas: D R McKinney
KEYSTONE & HAYWIRE MINES, near Troy, underground, Au, Ag, Pb, Zn
FLOT & CYANIDE MILL

MORROW, WILLIAM
Basin
BLUEBIRD MINE, Galena Gulch, near Basin, Pb, Ag.

MOUNTAIN VIEW MINE
Maxville
Operator: Leon Heroux
MINE, Boulder dist, Granite Co, Cu

N & N MINING CO
Box 1069, Helena
Mgr: A E Nugent
MEADOW MINE, 2 mi N of Clancy, underground, Ag, Pb, Zn
Supt: Henning Norgaard

NANCY LEE MINES, INC
410 Main St, Kellogg, Idaho
Gen Mgr: Frank Eichelberger
NANCY LEE GROUP, Superior, underground, Ag, Pb, Zn, Cu
AMY, MATCHLESS & BOBBY ANDERSON GROUPS, Pine Creek dist, Kellogg, underground, Au, Ag, Cu, Pb, Zn
Gen Supt: C R Ranney
125-TON FLOT MILL
Supt: Jack Schroder

NEW NANCY HANKS MINES, INC
Garnet
Pres: K D Butler
VP: D F Brayton
Sec Treas: H A Bellows
NANCY HANKS MINE, Granite Co

NORTH BUTTE MINING CO
101 W Granite St, Butte
Pres: J E Parker
VPs: Daniel Coleman, R L Syck, T W Roche
Sec Treas: J F McCarthy
Gen Mgr: I E Serigstad
Ch Engr: C L Van Alstine
GRANITE MT MINE, 1 mi NE of Butte, shaft, Cu, Zn, Pb, Au, Ag
Supt: Thomas Bennett
Foreman: Max Magus
LEACHING & PRECIP PL

NORTHWEST GOLD CORP
Whitehall
COLORADO MINE, 4 mi S of Whitehall

OJA, DAVE
500 6th Ave S, Great Falls
MARY LUCILLE #1, 2, 3, White Hawk, underground, dev

OLIPHANT, CLARENCE
Butte
CUMBERLAND MINE, leased from Cumberland Mines

OTIS WILLIAMS & CO
Box 1124, Helena
POORMAN & McCLELLAN CR MINES, dragline dredge placers, Au, Ag

PERHAPS MINE
Whitehall
Operator: Ed Rice
MINE, Jeferson Co, Au, Ag, Cu, Zn, Pb

PERRY & SCHROEDER MNG CO
26 W 6th Ave, Helena
Mgr: Owen H Perry
Treas: J A Schroeder
MISSOURI RIVER BARS PLACER, near Helena, bucket dredge, Au, Ag, Saphires
Dredgemaster: Archie Koppes

PHOSPHATE & MINERAL DEV
Maxville
OWNERS: Murr, Johnson & Ingersoll
MINE, near Maxville, Granite Co

POTRATZ, G G
Box 366, Avon
CYCLONE MINE, 12 mi N of Avon, shaft, adit, idle

PROSPERITY MINES CO
Missoula
Owners: Wilson, Engdahl, Lahaie, Jewell & Root

RAMSEY & STEEL
Dillon
H & S MINE, Beaverhead Co, Pb

REED, JIM
Twin Bridges
SHOEMAKER GROUP, 9 mi N of Twin Bridges, underground, Au, Pb

RENZ, HARRY
Dillon, 133 N Rife St
PINE TREE MINE, Au, Ag, idle

REVENUE MINES DEV CO
Norris
Pres & Mgr: R E Emry
VP: A H Emry
Sec Treas: A M Welles
REVENUE GROUP, 7 mi SW of Norris, Au, idle

RIEBHOFF, MARVIN
Whitehall
GOLDEN SUNLGHT, Jefferson Co, Au, Ag

RUBY GULCH MINING CO
Zortman
VP: G Donaldson
Sec Treas: M W Engle
Gen Mgr: E A Scholz
RUBY GULCH MINE, open pit, Au, Ag
Mgr: F B Bryant
Engr: Hans Schroeder
300-TON CYANIDE PL
Supt: Max Klimper

RUBY SILVER MINE
Radersburg
MINE, option to R & Stewart, Ag, Pb, Zn

SHAFER & RENZ
Box 832, Dillon
SHAFER GROUP, Argenta dist, underground, Au

SIERRA TALC & CLAY CO
5509 Randolph St, Los Angeles, Calif
Pres: Dorothy Dodds
Gen Mgr: E W Stevens
YELLOWSTONE MINE, Ennis, 52 mi N of West Yellowstone, adit, Talc

SIGNAL MINING CO
Kellogg, Idaho
Pres: R E Brown
VP: G Noonan
Sec Treas: W R Brainard
NEW YORK-MONTANA MINE, Bannack, underground, Au
Engr: Gunnar Johnson

SILVER BULLION MINES CO
White Sulphur Springs
MINE, Meagher Co, Ag

SOLUBLE PHOSPHATES, LTD
Box 8, Maxville
Pres: Lee H Skeels
PHOSPHATE MINE, Maxville
50-TON MILL

SPAULDING MINES INC
Poplar
Pres: B W Andresen
VP: Lorentz Holum
Sec Treas: Thelma Andresen
MINE, Poplar, idle

STAR MINE & MILL
Neihart
Gen Mgr: L B Stark
STAR & GALT MINES, N of Neihart, winze, Ag, Pb, Zn
80-TON FLOT MILL

SUNRISE MINES, INC
Basin
Pres: J Kogolshak
Gen Mgr: A C Ballansky
EUREKA CLAIM, Basin, Au

SWANSEA MINES, INC
Box 904, Helena
Pres & Gen Mgr: C L Hewitt
SILVER BELL MINE, 40 mi NW of Helena, undgrnd, Au, Ag, Cu, Pb
Supt: Oscar Fullner
200-TON FLOT MILL

SWEENEY & ASSOCIATES
Superior
LITTLE ANACONDA MINE, Mineral Co, Ag, Pb, Zn, Cu

SYLVAN GOLD MINES, INC.
Basin
Directors: P V Phipps, H Phipps, A J Cavers, O A Bittrick, H O Bittrick
FREEBURG group, Jefferson Co, Au, Ag, Cu, Pb

SYLVIA MINES
(a partnership) Box 321, Dillon
Mgr & Purch Agt: G M Fleming
SYLVIA MINE at Argenta, underground Au, Ag, Pb
Mine Supt: R M Fleming
2 tons prod daily

TAYLOR-KNAPP CO
Box FF, Philipsburg
Pres: S R Knapp
VP & Gen Mgr: A V Taylor Jr
VP: Alf C Kremer
Gen Supt: Donald S Johnson
MOORLIGHT GROUP, Philipsburg, underground, Mn, Ag, Zn
Mine Foreman: C H Reistad
Mill Foreman: G Kneale
Ch Engr: Charles P Knaebel
Assay: F S Neal
100-TON GRAVITY & MAGNETIC MILL

TRIANGLE GYPSUM CORP
Judith Basin & Cascade Co
Partners: J A Chambers, M M Chambers, and W G Baucus

TRI METALS, INC
Box 403, Philipsburg
Pres: Lester S Harrison
Secy-Treas: Frank J Schultz
NORTH GRANITE GROUP, Au

TRI-STATE MINERALS CO
Box 227, Dillon
Home Office: Southern Calif, Minerals Co, 320 S Mission Rd, Los Angeles 33, Calif
Owner: Walter K Skeoch
Div Mgr: John R Pyner
SMITH DILLON MINE, 12 mi SE of Dillon, open-pit, Steatite Talc
Mine Supt: Ernest Nygren
Mine Foreman: Edward G Nettik
250-ton prod weekly

TURNER, RUFUS
Basin
GREY LEAD MINE, 10 mi NW of Basin, adit with cut-fill stoping, Pb, Au, Ag, As
20-TON GRAVITY MILL
Idle

UNITED MINES CO
Box 917, Butte
Pres: L R Dickason
VP: N Z Walker
Secy-Treas: W C Walker
Gen Mgr: C Owen Smithers
Geol: Chas M Massey
TOURMALINE & 36 other mines under dev, 15 mi NE ofBoulder, open-pit, Au, Ag

U S GRANT MINING CO
Virginia City
Pres & Gen Mgr: Walter H Myers
VP: William G Schmidt
U S GRANT, ALAMEDA-BAMBOO, CHIEF & EASTON-PACIFIC MINE, Virginia City, underground, Au, Ag
Mine Supt: Ahti K Hanni
12,000 tons crude ore prod yearly
E O FELDA MINE
60 tons per day
Mill under dev

UNITED STATES GYPSUM CO
300 W Adams St, Chicago 6, Ill
(For officers, see Calif listing)
UNDERGROUND GYPSUM MINE at Heath
350 tons daily

VERMICULITE CO OF AMERICA
406 Thorpe Bldg, Minneapolis, Minn
Pres: Stanley Gray
MINE near Hamilton, Vermiculite

VICTOR CHEMICAL WORKS
See North Central listing
Supt in chg of Mont operations & Plant: C G Derick
Prod Supt: C Hendrickson
Supt in chg of mng operations: William Anderson, Jr
MINE at Maiden Rock, underground, Phosphate rock
ELEMENTAL PHOSPHORUS PL, under construction at Silver Bow, Electric furnacing

VICTORIA MINES, INC
Sheridan
Pres: John T Potts, c/o Galigher Co, SaltLakeCity, Utah
Underground & open-pit mines, 2 mi W of Silver Star, Pb, Zn, Au, Ag
Mill Supt: Walter Giebel
150-TON FLOT MILL
125 tons prod daily

WEST MAYFLOWER MINING CO
304 N Main St, Butte
Pres: F A Linforth
VP: A C Bigley
Sec-Treas: K B Frazer
WEST MAYFLOWER MINE, 11 mi SE of Whitehall, Au, Ag
shaft operation with square-set stoping

WESTERN MONTANA EXPLORATION & DEVELOPMENT CO
Missoula
Partners: Dr R W Key, O J Durand & F A Hancock

WILLIAMS PHOSPHATE CORP
Canyon Camp, Madison Co
Pres: Griff Williams
Phosphate property, 20 mi S of Alder, Madison Co, under dev.

WRIGHT MINE
Barker Dist
Operator: Thorson & Brazee, Monarch
Zn, Pb, Ag, Cu

WYOMING-MONTANA MINING & ENGR CO, Sheridan
Pres: Sam Egbert, Powell, Wyo
VP: M R Massey
Sec Treas: Merle Barnhart
LATEST OUT MINE, 6 mi E of Sheridan, shaft, adit, Au, Ag, Pb, Cu

YOB, JUANITA & PARRY
Philipsburg
GRANITE & BI-METALLIC MINES, 4 mi SW of Philipsburg, shaft, adit, Au, Zn, Pb, Au, Mn
200-TON FLOT MILL

YOGO MINING CORP
Lewistown
PLACER, Yogo Canyon, dev saphires

ZONOLITE COMPANY
135 S La Salle St, Chicago, Ill
Pres: A T Kearney
VP & Treas: W J Bein
MINE, near Libby, open cut, Vermiculite Mica conc
Mgr: R A Bleich
Purch Agt: B J Dorigton
120-TON MILL

NEVADA

ADOOR, GEORGE
Ruth
Owner: Kennecott Copper Corp
VETERAN GROUP MINE, Ag, Pb, Zn

AFFRANCHINO, ERNEST
Box 101, Eureka
STIBNITE MINE, 7 mi S of Eureka, shaft, adit, Pb, Ag
IRISH AMBASSADOR, Ag, Au
BROMIDE, Ag, Au

ALPINE MINING CO
Box 114, Gardnerville
FLOT MILL, 12 mi E of Gardnerville, W, leased to Metallurgical Dev Co
Mgr: J C Morris

AMES, ROY C
Ione
ALLIED MINES, open pit, Fluorspar

APEX MINE
Leased by Stephens, Edwards & Grimstead
MINE, 1 mi SE of Pioche, underground, Pb, Ag, Au

ARGENTENA CONS MINING CO
(See Calif listing)
Box 7, Goodsprings
ARGENTENA MINE, 8 mi W of Jean, adit, open stope, ZnPbAu, idle

ARISTA GOLD MNG CO
Beatty
Mgr: W H Callicott
ARISTA MINE, 10 mi S of Beatty, underground, Au, idle

ARMSTRONG, A R
Glendale
GRAND GULCH MINE, Clark Co, Ag, Cu

AUSTIN-JUMBO MNG CO
120-Bridge St, Winnemucca
JUMBO MINE, 45 mi NW of Winnemucca, open pit, Au, idle

AUSTIN SYN PROPERTY
Austin
MINE, 4 mi N of Austin, Au, Ag
Mgr: M B Moeliker
(Leased to O J Fundon)

BALDIN, HUGH M
Box 1232, Eureka
BALDIN MINE, Eureka Co, Pb, Ag, Zn

BARIUM PRODUCTS, LTD
Battle Mountain
Pres: M Y Seaton
Mgr: J B Perry
MOUND SPRINGS & VALLEY VIEW MINES, 26 mi S of Battle Mt, open pit, Ba
Supt: H J Tillia
Foreman: James Jury

BARYTE NO 1 MINE
Box 287, Battle Mountain
MINE, 16 mi from Battle Mt, open pit, Baryte
Mgr: Andrew J Shelton

BASIC REFRACTORIES, INC
(See North Central listing)
Gabbs
GABBS MINE & PLANT, open pit, Brucite, Magnesite
Gen Supt: N E Hanson
Asst Gen Supt: H P Willard
Purch Agt: M L McConnell

BATTLE CREEK-LEAD MINES
Box 637, Ely
GALENTE #2 MINE, 9 mi N of Ruby Valley, Pb, Ag

BATTLE CREEK TUNGSTEN
Ruby Valley
Pres: N W Bowring
TUNGSTEN MINE, open pit, dev
20-TON GRAV CONC, W

BELLAND, MARTIN & BAKER
Baker
PAULINE CLAIM, White Pine Co, Ag, Pb, Zn

BELMONT MINE & MILL CO
Box 1268, Ely
Mgr: D A Jennings
BELMONT MINE, 54 mi SE of Ely, underground, Pb, Ag

BENEDICT & WALKER
Box 621, Babbitt
W B P CLAIM, Mineral Co, Pb, Ag

BENSON BROS
Ely
GOLDEN ROD MINE, White Pine Co, Au, Ag, Pb, dev

BIG CREEK MNG & MLG CO
Austin
Mgr & Sec Treas: Tony Romano
BRAY MINE, Lander Co, Sb
50-TON MILL, Austin

BIG DICK MINE
Box 155, Boulder City
MINE, Ag, Cu, Pb, Zn
Operator: F B Wheelwright

BLACK PRINCE MINING CO
Pioche
Pres: Mrs C B Wheeler
Sec Treas: E J Deck
MINE, Pioche, Mn, Au, Ag, dev

BLACK ROCK DESERT MIN CO
821 Market St, San Francisco, Calif
MINE, Sulphur, 58 mi W of Winnemucca, irregular orebody
400-TON MILL, crushing & screening

BLACK ROCK MINES
Valmy
MINE, 19 mi S of Valmy, open pit, Mn
(Leased to E H Potter)

BLUE DIAMOND CORP
Blue Diamond
MINE, open pit, underground, Gypsum
Wks Mgr: H L Waldthausen Jr
Mine Supt: M C Brooks
Prod: 900 tons
800-TON MILL & PLANT

BLUE STAR MINES, LTD
Box 781, Big Pine, Calif
Pres & Gen Mgr: John Spindler
Sec Treas: F G Spindler
REED TALC MINE, 20 mi W of Lida, underground, Talc, dev
Gen Supt: C V Harris
Foreman: E S Calson
ZURICH MILL, Zurich
Foreman: Jesse Hildebrand
Prod: 75 tons

BONANZA HILL MINES
Goodsprings
Partners: Kennedy & Woodward
ROOT ZINC MINE, Goodsprings, Ag, Pb, Zn

BOYCE BROS
Elko
ECHO CANYON MINE, Elko Co, Ag, Pb

BRADSHAW, MARK G
Tonopah
WAR EAGLE MINE, underground, Au
100-TON CYANIDE MILL, dev

BRISTOL SILVER MINES CO
218 Felt Bldg, Salt Lake City, Utah
Pres: G W Snyder
VP: E H Snyder
Sec Treas: C M Christensen
Purch Agt: E G Back
MINE, Bristol City, 25 mi N of Pioche, shaft, adit, Pb, Cu, Zn, Ag, Mn, Au
Gen Mgr: J H Buehler
Supt: D E Hyde

BROKEN HILLS MNG & MLG
Box 264, Babbitt
MINE, Churchill Co, Au, Ag

BURGNER, DON
Box 485, Bishop, Calif
BLACK HORSE MINE, 40 mi SW of Tonopah, open pit, W

BYRN'S BASIN MINES
Tuscarora, Sb

CAHILL MINES, INC
Box 347, Winnemucca
Pres: G I Gould
VP: E L Elliott
Sec Treas: C S Balch
CAHILL MINE, 50 mi N of Winnemucca, vein, adit, Hg, 10 tons
Supt: B A Wharton
CAHILL MILL, Gould rotary furnace

CALDER, DR WALLACE
Winnemucca
WADLEY MINE, 15 mi SE of Mill City, underground, dragline dredge placer Au, Ag

CALLAHAN ZINC LEAD CO
(See North Eastern listing)
ELY VALLEY MILL, 1 mi E of Pioche, 250-ton, flot
Gen Supt: L E Davis
Supt: E Lowman
Foreman: V W Washburn

CALLICOTT, W H
c/o Arista Gold Mng Co, Beatty
ARISTA MINE, Nye Co, Au, ag, idle

CALTO, JOHN
Imlay
RIVERVIEW MINE, Pershing Co, Au, Ag

CARDINALLI & FRANK
Box 53, Eureka
EXTENSION MINE, 22 mi W of Eureka, underground, Zn, Pb

CASTLE MT MINING CO
c/o J H Alleman, Box 1229, Salt Lake City, U
Pres: R H Merrill
VP: B F Robbins
Sec Treas: J H Alleman
CASTLE MT MINE, Lander Co, underground, Pb, Ag, Zn, Au, Cu, dev
Supt: A J Cooley

CENTRAL COMSTOCK MINES
Box 339, Virginia City
Mgr: H B Chessher
CHOLLAR, POTOSI, SAVAGE & HALE NORCROSS GROUPS, Au, Ag, idle
125-TON CYANIDE MILL

CHAMPION CITY MINES, INC
514 W Superior St, Duluth, Minn
Pres: Urop Kyto
Sec Treas: M Kyto
LUCKY BOY MINE, Hawthorne, Alum dist, Ag, Pb, Zn, dev
250-TON FLOT PL

CHANCE MINE
Cherry Creek
MINE, underground, W
(Leased to John Boundy)

CHARLESTON HILL NAT'L MINES CO, 239 E 3rd, Winnemucca
Pres: Mrs Mary Clough
VP: C G Brailey
Sec Treas: L R Grantz
BLACK DIABLO MINE, Box 176, Golconda, 21 mi S of Golconda, adit, MnO_2

CHEROKEE MINING CO
Viola, via Caliente
CHEROKEE MINE, Lincoln Co, Ag, Cu, Pb

CHERRY CREEK TUNGSTEN MNG
Box 2, Cherry Creek
Pres & Mgr: Kenneth Cleghorn
Sec Treas: Willard Cleghorn
MINE, Cherry Creek, W
50-TON FLOT MILL

CHESCO MINING CO
422 Gazette Bldg, Box 889, Reno
Gen Mgr: H B Chessher
JUNIATA MINE, Aurora via Hawthorne, Au, Ag
Supt: Hubert Chessher Jr
100-TON MILL

CHICK BED CO
Fernley
CHICK BED MINE, 22 mi E of Fernley, open pit, Diatomaceous earth
Supt: Lowell Smith

CHIMNEY MINES
Box 516, Lovelock
Owner: Elmo G Burgess
CHIMNEY MINE, 35 mi NW of Lovelock, underground dev
PHONOLITE MINE, 35 mi NW of Lovelock, underground, dev
5-TON CYANIDE MILL

CIMARRON MINE
Tonopah
Owner: E M Booth
MINE, 16 mi NW of Tonopah, underground, Au, Ag, dev

CIRAC, CHARLES C
Stillwater
REVENUE MINE, 40 mi NE of Fallon, underground, Fluorspar

CLARA MINE
Box 716, Ely
Owner: Korgan-Piscovich
MINE, Robinson dist

COLUMBIA MINE
Box 1288, Ely
MINE, 1 mi E of Ruth, Robinson dist, underground, open pit, Zn, Pb, Cu, Au, Ag

COMB GROUP LODE MINES
Goodsprings, Ag, Pb
Operator: O F Schwartz

COMB METALS REDUCT CO
(See Utah listing)
Supt, Nev Oper: S S Arentz
Geol: Paul Gemmill
CASLETON & #1 MINE, 3 mi W of Pioche, shaft, Zn, Pb, Ag, Au
Prod: 700 tons
Supt: R R Durk
Foreman: J J Russell
Engr: John Atkins
SOUTH PAW MINE, 20 mi NW of Hiko, surface, Mn, 20 tons
Foreman: R D Wilkin
PAN AMERICAN MINE, 20 mi W of Pioche, undgrnd, Zn, Pb, Ag, Mn,
Supt: E S McIntyre
Foreman: James Hulse
MT VIEW, LONE MT, 20 mi W of Eureka shaft, Zn, Pb, dev
Supt: Louis Gibellini
DEERTRAIL MINE, 50 mi N of Pioche, adit, W
Supt: Owen F Wlaker
150-TON MILL, Prince, under const
CASELTON MILL, flot-HMS, Zn, Pb, Ag
Supt: W G Fidler
Asst Supt: C H Likins
Ch Chem: R M Wigglesworth
Prod: 1200 tons
PIOCHE MILL, flot, Au, Ag, Pb, Zn
Supt: W G Fidler
Prod: 800 tons

COMET MINE, INC
Pioche
COMET MINE, 25 mi W of Pioche, shaft, Pb, Zn, Ag, W, Au
Supt: E S McIntyre
Foreman: James Hulse

COMMODORE MINE
Mina
Owners: Olsen, Cram & Tylor
MINE, 27 mi from Mina

CONQUEST MINE
c/o Gale Peer, Austin
MINE, 20 mi E of Austin, shaft, W
Foreman: W E Hanlon

CONRAD, R M
Box 82, Gabbs
CHARLOTTE COOPER & BEACON CLAIMS 3 mi S of Gabbs, open pit, W

CONS CHOLLAR GOULD & SAVAGE MINING CO, Gold Hill
OVERMAN MINE, Gold Hill, open pit, Au, Ag
Supt: F V Dempsey
Engr: W G Reid
CYANIDE MILL, Gold Hill
Supt: D T Powell
Assay: J C Morrison

CONS COPPERMINES CORP
120 Broadway, New York 5, N Y
Pres: C D Tripp
VP: C F Leaman
Sec Treas: C L Steegar
Gen Mgr: A J O'Connor

NEVADA OPERATIONS, Kimberly
open pit, Cu, Au, Ag
Ch Engr: H W Bishop
Ch Clk: John Eaby
Mast Mech: Thomas Filmour
Ch Elec: M N Shields
Expl Supt: J F Sharp
Ch Chem: L Mathis

CONS EUREKA MINING CO
Eureka
Pres: J E Hogle
Mgr: Wm Sharp
DIAMOND & EXCELSIOR MINES, Eureka, dev

CONSTANT, BENJAMIN
Box 1607, Reno
GALENA HILL MINE, Washoe Co, Au, ag

CONSTANT MINERALS SEP PROCESS, INC, Box 1607, Reno
Pres & Gen Mgr: Maurice Constant
VP: H C Howell
Sec Treas: Mary Smith
MONKOTA MINE, 6 mi S of Sulphur, open pit, Sn, W, T, Hg, Au, Ga
Supt: B I Constant
GRAV MILL, 100 yds per hour

COPPER CANYON MINING CO
Battle Mountain
Pres: L E Whicher
VP & Gen Mgr: R H Raring
COPPER CANYON MINE, 18 mi SW of Battle Mt, Pb, Ag, Zn, Au, Cu, shaft
Supt: A J Wondershek
Engr: G T Brown
Elec Engr: Ed Farley
350-TON FLOT MILL
Supt: Ralph Hayden
Foreman: Peter Markervil
Assay: L C Johnson

COPPER VALLEY MINE
Agt: W A DeWitt, 937 2nd Ave, Salt Lake City, Utah
MINE, 94 mi NE of Ely, undgrnd, Cu

CORDERO MINING CO
57 Post St, San Francisco, Calif
Pres: J N Pew, Jr
VP: S H Williston
Sec Treas: John Agnew
Gen Supt: V P Haas
CORDERO MINE, 11 mi SW of McDermitt, shaft, Hg
Foreman: Kenneth Reed
90-TON HERRESCHOFF FURN
Foreman: Harry Clemens
Met: J M Gomes

CORLETT, JAMES
Ione
LAXEY & FLORENCE MINES, Nye Co, Au, Ag, idle

CORNELIUS, LE
Mina
Owners: Leland, Casey & Sullivan
JASPER MINE, Mineral Co, Ag, Cu

COULTER, W S
Battle Mountian
COPPER QUEEN MINE, Lander Co, Au, Cu
DEAN MINE, Lander Co, Ag, Pb

CRAFTS & PETERSON
Hinckney, Utah
MINE, White Pine Co, Ag, Pb

CROSS, DEANE L
Carson City
MARY ANN MINE, Nye Co, Au, Ag

CROWELL, J I, JR
Box 96, Beatty
FLUORSPAR MINE, 5 mi E of Beatty, underground
50-TON GRAV FLOT MILL

CURIEUX & BATEMAN
Tonopah
THE CATLIN MINE, Kawich Range, 50 mi SE of Tonopah, undgrnd, Au, Ag

WIEHER & ASSOC
826 S Third St, Las Vegas
Gen Mgr: R F Bibb
SURPRISE & LUCKY DUTCHMAN GROUPS, Crescent, undgrnd, Au, Ag, Fluorspar
Supt: C H Chandler
Foreman: Carl Hill
Assay: H D Chandler

DAKIN, FRED H
2811 Hillside Dr, Burlingame, Calif
CERVANTITE MINE, Lovelock, underground dev, Sb

DAVIS, RUSSELL E
Battle Mountain
D & E PLACER, Lander Co, Au

DAYTON DREDGING CO
Box 513, Carson City
Operator: Gus Recker
PLACER, open pit, Au

DE LA MARE
Wadsworth
RENEGADE MINE, Washoe Co, Au, Ag

DE LAY, J M
Lovelock
AUBURN MINE, Pershing Co, Au, Ag

DE LONGCHAMPS F J
Box 2244, Reno
Owner: N Nenzel
TALAPOSSA MINE, 15 mi S of Fernley, underground, Au, Ag

DE ROUSSE, LOUIS
Mina
LONDON SILVER-LEAD MINE, Mineral Co

DESERT MILLING CO
1230 E 109th St, Los Angeles, Calif
Mgr: C H Chandler
Foremn: H D Chandler
QUARTETTE MINE, tailings, dumps, ores, Sehrchlight, Au, Ag
100-TON CYANIDE MILL

DODGE CONST CO
Fallon
Pres: E J Maupin
NATIONAL & HOLLYWOOD MINES, underground, Sb
GOLDEN QUEEN MINE, Esmeralda Co, placer, Au

DONNELL, CHARLIE
Box 531, Lovelock
COLORADO PLACERS, 50 mi NW of Lovelock, Au, Ag
Dry Washing Pl

DONNELLY, L C
Sulphur
SAWTOOTH PLACER MINE, Humboldt Co, Au

DOTY, W
Goodsprings
NOON & ROOT MINES, Clark Co, Ag, Pb

DOUBLE KING MINES, INC
Silver City
SILVER HILL MINE, Storey Co, Au, Ag
DONOVAN MILL, Silver City
100-TON CYANIDE AMAL PL, idle

DRUMM, A D, JR
Fallon, Sb

DUNN, C G
Mountain City
RIO TINTO MINE, Elko Co, Ag, Cu

DUTCH FLAT MINES INC
Winnemucca
Pres & Gen Mgr: T A Cowan
VP: J B Hamon
MINES, 22 mi N of Winnemucca, undgrnd & placer, Au, Hg, W

EAST STANDARD MNG CO
c/o Ernest Woolley, Hotel Utah, Salt Lake City, Utah
MINE, 55 mi SW of Ely, White Pine Co, Pb, Ag

EL DORADO MINES, LTD
Box 31, Winnemucca
Pres: O R Manula
Gen Mgr: Krand Wickham
Sec: Gus Rogers
Purch Agt: Frank Wickham
EL DORADO MINE, 45 mi NE of Winnemucca, underground, Au
Supt: S J Putnam
Engr: A A Hutton
CANE SPRINGS MILL

ELY GOLD MINING CO
Box 686, Ely
Pres: W G Goodman
Sec & Mgr: W J Walker
JENNY A MINE, White Pine Co, Au, Ag

ELY VALLEY MINES, INC
Pioche
Gen Mgr: John Janney
Supt: Pat English
ELY VALLEY & MENDHA MINES, Lincoln Co, undgrnd, Pb, Ag, Au, Zn

ENDOWMENT MINE
Box 311, Tonopah
Mgr: Mark F Bradshaw
MINE, idle, Pb, Zn

ERRINGTON-THIEL MNG CO
Ruby Valley
MINE, 65 mi S of Wells, undgrnd, open pit, dev, Ruby Mica, Beryl
HOLIDAY MINE, 50 mi S of Wells, underground, Cu, dev
GRAV FLOT MILL

EUREKA CORP, LTD
Eureka
Pres: T Lindsley
VP & Gen Mgr: G W Mitchell

RICHMOND-EUREKA MINE, 2 mi W of Eureka, underground, Au, Ag, Pb, Zn
Supt: V Manz
Engr: J Brozo
Foreman: E Melka

EUREKA MINES, INC
Silver City
COMO MINE, Lyon Co, Au, Ag, idle
(Leased to Conway & Haddy)

FALLON FLUORSPAR MINES
1100 Mills Tower, San Francisco
Pres: B A Gould
VP: H W Gould
Sec Treas: M B Gould
Gen Supt: M J O'Boyle
BAXTER MINE, Box 391, Fallon, Fluorspar

FARNSWORTHY-ELY COMB METAL MINES, INC
Box 1173, Ely
Pres & Gen Mgr: F A Farnsworth
WARD EXT, SUNNYSIDE & ELY MAGMATIC, Hamilton, Au, Ag, Cu, Pb
Purch Agt: Harvey Young
Supt: F L Farnsworth
Engr: F W Millard

FEHN & JOHNSON
Manhattan
GEORGIA, AJAX, JIM & CROWN PLACERS, Nye Co, Au

FINCH & McALLISTER
Gold Point
MINE, 2 mi E of Gold Point, Au, dev

FIRST URANIUM CORP of NEV
Imlay
MAJUBA MINE & MILL, 22 mi N of Imlay, undgrnd, Sn, Cu, Ag, Au

FLETCHER MNG & MLG CORP
Box U, Manhattan
Pres: R W Fletcher
FLETCHER MINE, dev, Au
Supt: E J Hyde

FRANCISCO, JOE
Manhattan
JUMBO CLAIM, Nye Co, Au, Ag, idle

FROST, CARL A
Victorville
Owner: Chris Juhl
FOUTH OF JULY GROUP, Nye Co, Au, Ag, idle

GABBS EXPLORATION CO
Gabbs
Pres & Gen Mgr: Lee D Dougan
VICTORY TUNGSTEN MINE, 8 mi N of Gabbs, underground
Supt: Bart Van Voorhis
100-TON GRAV MILL, Gabbs
Supt: Coleman Harcourt

GALENA MINE
Baker
Operator: W E Hanlon
MINE, White Cloud dist, Ag, Pb

GARDNER MINES
Box 413, Ely
Gen Mgr: C A Gardner
NELLEY VIEW & MERRIMAR GROUPS, 20 mi SE of Ely, un dergrouond, open pit, Au, Ag, Pb, Zn, Cu, dev

GARRISON, ROY E
Wadsworth
MONARCH & TEXAS #3 CLAIMS, Washoe Co, Au, Ag, Cu

GEORGE, THOMAS
Beowawe
VIOLA MINE, 23 mi S of Beowave, underground, Cu, Ag, Au, dev

GERGEN & KARIDES
Box 1032, Eureka
CHAMPION GROUP MINES, Eureka Co, Ag, Pb, Zn

GETCHELL MINE, INC
Box 2520, Reno
Pres: George Wingfield
VP & Gen Mgr: N H Getchell
Sec Treas: T L Willcox
Supt: R A Hardy
GETCHELL MINE, Red House, underground, open pit, Au, W, As
PINSON-OGEE LEASE, Red House, open pit, Ag
1500-TON CYANIDE MILL
400-TON FLOT MILL, W

GIROUX, L D & R J
Box 105, Mina
Supt: Matt Obert
SAN MIGUEL MINES, MARIETTA MINES, 25 mi W of Mina, underground, Au, Ag, dev

GLIDDEN CO, DIV 34, CALIF-NEV BARYTES MINES
766 50th Ave, Oakland 1, Calif
Pres: D P Joyce
Gen Mgr: E L Ralston
Purch Agt: A A Gibeaut
BARIUM KING, Battle Mt, open pit
JUMBO, Tonopah, open pit, barite
Formn: Roy McDowell

GODWIN, TOM
Box 351, Lovelock
BLUE SKY MINE, LIMERICK MINE, Pershing Co, Au, Ag

GOLD METALS CONS MINES
Box 351, Tonopah
MINE, Nye Co, Au, Ag, idle

GOLD RANGE COPPER MINE
Box 107, Mina
MINE, 9 mi SW of Mina, open pit, Cu, Au, Ag
(Leased to Milton R Sutton)

GOLDEN CENTURY INDUS, INC
Box 591, Carlin
COPPER KING MINE, 18 mi N of Carlin, underground, Cu
Supt: Frank Dean

GOLDEN DAWN MNG & MLG CO
Searchlight
Pres: H C Mills
Mgr: G C Dav's
MORNINGSTAR MINES, Searchlight, underground, Au, Ag, Cu, Pb

GOLDEN EMPIRE MINING CO
Searchlight
Pres: J B Evans
Purch Agt: Wendell Romine
HERLAND MINE, Nelson, underground, Pb, Zn, Cu, Ag, idle
Foreman: J J Dietrich
25-TON FLOT MILL, Nelson

GOLDEN ENSIGN MINING CO
Box 74, Mountain City
GOLDEN ENSIGN MINE, 1 mi E of Mountain City, underground, Au, Ag, Pb, Mo, W
Supt: D C Despain

GOLDFIELD CONS MINES CO
Box 2520, Reno
Pres: George Wingfield
Sec: G M Spradling
VP & Gen Mgr: E A Julian, San Francisco, Calif

GOLDFIELD DEEP MINES CO of NEV, Goldfield
(See Newmont Mng Corp, Calif)
Pres: Martin Duffy
Mgr: Don Hargrove
Purch Agt: T S Pay
WHITE ROCK, LAGUNA & FLORENCE MINES, Goldfield, undgrnd, Au, Ag
Supt: E B Taylor
Engr: C C Chamberlain
100-TON FLOT MILL
Supt: W H Hiale
Assay: J Mering

GOLDFIELD DEV CO
Box 687, Goldfield
Pres: F J Friday
VP: George McKay
Sec Treas: N J Barbarich
Gen Mgr: W J Frank
TONOPAH TUNGSTEN MINE, Box 351, Tonopah, 8 mi N of Tonopah, W, dev

GOLD OF OPHIR PLACERS
340 Main St, Lovelock
Pres: J J Chambers
PLACER, 40 mi N of Lovelock, dragline dredge, Au, dev

GOOD HOPE PLACERS, INC
Winnemucca
THOMAS CANYON ZINC MINE, 9 mi SE of Winnemucca, undgrnd, Zn, dev
Supt: Dave See

GOUDEY HATFIELD
Box 529, Yerington
Owner: AC Sayre
JACK POT MINE, 8 mi SE of Wellington, underground, Pb, Zn, Ag, Au, Cu, idle

GOURLEY, JAMES
Box 607, Winnemuca
MINE, Humboldt Co, Au, Ag, Pb, Zn

GRAHAM DEV CORP
1000 Lincoln Rd, Miami Beach, Fla
Pres: C R Graham
VP: J S Graham
Sec Treas: Arthur H Seiler
Mgr: R E Margenau
GOLDEN EAGLE & GILDED AGE MINES, Box 727, Ely, 40 mi SE of Ely, undgrnd, Au
GOLD KING & BLACK HORSE MINES, 54 mi SE of Ely, shaft, W, Au
Supt: B E Rees
25-TON MILL, Goody Station

GRAND DEPOSIT MINING CO
409 Ness Bldg, Salt Lake City, Utah
Pres & Gen Mgr: P C Lyon
GRAND DEPOSIT MINE, 25 mi NE of McGill, undgrnd, Zn, Pb, Cu, Ag, Au
KANSAS COPPER MINE, 24 mi NE of McGill, undgrnd, Cu, Ag, Au
(Leased to Nat'l Copper Mines, Inc)

GRAY EAGLE MINE
Palisade
Operator: H C Merrick
MINE, Elko Co, Ag, Cu

GREAT AMERICAN MNG CORP
Eureka
MINE, Eureka Co, Ag, Pb

GREAT LAKES CARBON CORP
DICALITE DIVISION, 612 S Flower St, Los Angeles 17, Calif
Pres: George Skakel
Asst Gen Mgr: E T Frankenhoff
Prod Mgr: McKinley Stockton
Ch Engr: D F Dyrsmid
PLANT #3, Basalt
Supt: C F Schuhole

GREENAN PLACERS
500 Ridge St, Reno
MINE, Battle Mt, bucket dredge
(Leased to Natomas Co)

GREY EAGLE DEV CO, INC
Beowawe
Pres & Gen Mgr: F G Risley
VP & Supt: J P McGlynn
Foreman: P O Liebel
GREY EAGLE MINE, 35 mi from Beowawe, undgrnd, Ag, Au, Pb, Zn

GRITTON & HOSKINGS
Rt 1, Box 541, Reno
SUNNYSLOPE MINE, 35 mi SE of Yerrington, underground, Au

GROOM MINE
Box 68, Caliente
MINE, 86 mi SW of Caliente, open pit, Pb, Ag
100-TON GRAV FLOT MILL
(Leased to Dan Shaehan)

HAMBURG LEASE
Pioche
HAMBURG MINE, 9 mi W of Pioche, underground, Au, Ag, Pb, idle

HAMILTON DEV CO
c/o J V Saselli, Ely
MINE, near Ely, undgrnd, Ag, dev

HAMILTON, R K
Box 156, Goodsprings
KIRBY MINE, Clark Co, Ag, Pb

HARRIS, D F, A F, & D M
Box 846, Tonopah
KLONDYKE MINE, Esmeralda Co, undgrnd, Pb, Ag, Au, dev

HARRIS, HARRIS & LULL
Box 846, Tonopah
MORNING STAR #4 & KLONDYKE MINES, Nye Co, Au, Ag, Pb

HAZEN & HARRIS
Box 128, Carson City
BLACK EAGLE MINE, Near Valmy, Mi

HENEBERGH, JOHN
Box 152, Round Mountain
MINE, near Round Mt, U, dev

HERLAND MINE
Nelson
Owners: Dietrich & Mead
MINE, Nelson, Au, Ag, Pb, Zn

HESS, FRED
Virginia City
PYRAMID MINE, Storey Co, Au, Ag

HI-BAR CO
Box 90, Imlay
Pres & Gen Mgr: B C Hoaist
IRON CANYON MINE, dozer placer, Au
WILLOW CREEK MINE, 13 mi S of Mill City, open pit, Au

HICKS, HICKS & MILLER
Schurz
RED GRANITE MINE, Mineral Co, underground, Au, Ag, dev

HILL & CHIATOVICH
Gabbs
SAN RAFAEL MINE, 15 mi N of Gabbs, underground, Pb, Zn, Au, Ag, 300 tons

HOAGLAND, GEO E
Box 293, Winnemucca, Sb

HOLSTEN, JOHN G
Goodsprings
WHITE SPOT MINE, Clark Co, Ag, Pb

HOOSIER CLAIM
Goodsprings
Owner: W T Fraser
MINE, Yellow Pine dist, Ag, Pb

HUDSON, ARTHUR
Box 11, Manhatten
STRAY DOG MINE, Nye Co, Au, Ag
10-TON MILL

HUGHES JOHN & SONS
Box 378, Porterville, Calif
HUGHES GROUP MINES, Clark Co

HUMBUG MINE
Wells
Operators: Parker & Bollschweiger
MINE, Elko Co near Black Forest, Pb, Ag, under dev

HUMMEL, FRED E
Jungo
LAST CHANCE MINE, Humboldt Co, Au

HUTCHINSON MINE
Wadsworth
Owner: Emile Cabanne
MINE, White Horse dist, Au, Ag

HYDE, EMERSON J
Manhatten
IONE MERCURY MINE, 3 mi W of Ione, shaft dev, Hg

INDUST MIN & CHEM CO
6th & Gilman Sts, Berkeley, Calif
Pres & Gen Mgr: L R Moretti
JUPITER MINE, 2 mi S of Weeks, open pit, Fullers earth
Supt: Don Schueler
Mill Supt: Forest Rhoton

IRON KING ROYALTY CO
IRON KING & IRON LADY CLAIMS, Humboldt Co, Jackson dist, Fe, idle

IRON RAILROAD LEASE
Lovelock
MINE, 24 mi SE of Lovelock, open pit Fe, (Leased to Thomas & Blair)

JACKSON MINE
Montello, Ag, Pb
Operator: John F Ala

JOHNSON, GEORGE H
Box 558, Lovelock
C & M CLAIM, Pershing Co, Au, Ag

JOHNSON & HEIZER
Lovelock
LOVELOCK ANTIMONY MINE, Sb, idle

KADOW, LEON C
318 Belmont Ave, Tonopah
MINE, Au, Ag, W, prospect

KAPPLER CLAIMS
Carlin
Operator: Art Hansen
MINE, Lynn dist, Au, Ag

KEMPLE, G C
Goodsprings
MARDEN ROCK MINE, Clark Co, Ag, Pb

KENNAMETAL, INC
Fallon
NEVADA SCHEELITE MINE, Rawhide, underground, W
100-TON GRAV FLOT MILL

KENNECOTT COPPER CORP
(See North Eastern listing)
NEVADA MINES DIVISION, McGill
Gen Mgr: J C Kinnear Jr
Asst Gen Mgr: Paul Hett
Asst Purch Agt: W N Ireland
MINE, Ruth, open pit, Cu, Au, Ag, MoS
Supt: S W Smith
Asst Supt: R C Nispel
Ch Engr: K W Booker
Ch Clk: B A Gilman
18,000-TON FLOT MILL & SMELTER, McGill, two reverbs
Prod: 100,000,000 lbs Cu yearly
Mech & Elec Supt: W K Sanders
Conc Supt: L F Immonen
Smelt Supt: Ed Presout
Const: W F Jones
Compt: R W Crosser
NEVADA NORTHERN RY(subsidiary)
VP & Gen Mgr: H J Beem

KIDDER & KING
Beason Bldg, Salt Lake City, Utah
ONETHA, ORA WEST ONETHA & MILWAUKEE CLAIMS, Hamilton, 40 mi W of Ely, underground, Pb, Ag, Zn, Cu
Geol: F F Hintze

KIRBY CANYON MINES, INC
Box 106, Goodsprings
Pres: Thomas Hawkins
VP: A R Robbins
Sec: M B Hawkins
KIRBY CANYON MINES, Goodsprings, shaft, Pb, Ag, dev, 10 tons

KIRKENDALL & JACOBSON
Box 1049, Tonopah
Owner: Walter Bowler
FLORENCE MINE, Nye Co

KNOWLES BROS
Elko
PROTECTION MINE, Elko Co, Au, Ag, Cu, Pb
Owner: Walt Davidson

KNOWLES & MONTROSE CO
Mountain City
GARNET HILL & MONTROSE MINES, 21 mi E of Mt City, undgrnd, open pit, W, dev

KOGAN F P & W F
Box 716, Ely
CUBA 1-4, White Pine Co, Ag, Pb, Zn

KOPENITE CO
Box 217, Caliente
KOPENITE MINE, 33 mi SW of Caliente, open pit & underground, perlite
Supt: C L Averett

LAIRD, ABE
Kimberly
BAY STATE MINE, White Pine Co, Ag, Pb, Zn

LAKEVIEW TUNGSTEN CORP
Box 32, Imlay
Pres: R E Zumwalt
VP: C H Moncrief
Sec Treas: George Quick
TUNGSTEN MINE, 3 mi E of Humboldt House, underground, W, 50 tons

LAMB, CLINN E
Oreana
ANNIE CLAIM, Pershing Co, Au, Ag

LARSEN, DAVID H
Box 302, Battle Mountain
PITTSBURGH MINE, Lander Co, Au, Ag

LAST CHANCE MINE
Box 259, Ely
Operator: Barrett Pierce
MINE, Aurum dist, Ag, Pb

LAST CHANCE MINING CO
Box E, Round Mountain
LAST CHANCE MINE, 12 mi SW of Round Mt, underground, Sb
Supt: Nate Blake

LAURITZEN OPERATIONS, LTD
Box 96, Tuscarora
Ower: A A Lauritzen
NORTH BELLE ISLE MINE, Au, Ag, Cu, Pb
10-TON FLOT MILL

LEAD-COPPER MINES
Elko
BULLION MINES, 28 mi SW of Elko, underground, Pb, Cu, dev

LINCOLN MINE
Hiko
MINE, 40 mi W of Hiko, undgrnd, W
Supt: W F Elgin
(Leased to Black Rock Mng Corp)

LINDSAY MINING CO
Box 150, Mina
Mgr: Kenneth Dunham, Lindsay, Calif
GUNMETAL MILL, 24 mi SE of Mina, W
100-TON MILL, dev

LINKA, S H
Box 355, Austin
BI-METALLIC MINE, Nye Co, Ag, Pb, Zn

LITTLE DICK MINE
Box 155, Boulder City
Operator: F B Wheelwright
MINE, Ag, Cu, Pb, Zn

LOCKE, M E
Locke's via Tonopah
MOREY MINE, Nye Co, underground, Au, Ag, Pb, dev

LONCAR, JOHN
Box 708, Tonopah
GOLD BAR MINE, 2 mi SE of Lida, Ag, Pb, Zn, idle

LONDON EXT MINING CO
(See Colorado listing)
Beowawe
GOLDACRES MINE, 38 mi S of Beowawe, open pit, Au
Supt: R B Warmbrodt
450-TON CYANIDE MILL
Supt: H C Bishop, Jr

LONG CANYON MNG CO, INC
c/o Archie P Farr, 2784 Jefferson Ave, Ogden, Utah
Sec: Harry J Eldredge
KNOB HILL MINE, 14 mi E of Lee, underground, Pb, Ag, dev

LORANGER, W E
Silver City
HAYWARD MINE, Lyon Co, Au, Ag
(Leased from St Joe Cons Mines)

M E D LEAD & SILVER MNG CO
First Nat'l Bank Bldg, Salt Lake City, Utah
Pres: Pete Marthaine
Gen Mgr: C A Elkins
VICTORY CLAIMS, White Pine Co, Au, Ag, Zn, Fe dev
(Leased from O H Evans)

MANGANESE, INC
Box 2008, Henderson
Pres: H S West
VP: H R Golenor
THREE KIDS MINE, 6 mi SE of Henderson, Mn, dev
1200-TON FLOT MILL, under const
Met: Frank Trotter

MANHATTAN GOLD MINES CO
Fairfield, Calif
Pres: A R Coons
Gen Mgr: E L Dearborn
MINE, Manhattan, Au, Ag, idle
Foreman: R E Williamson

MARIGOLD MINE & MILL
Box 44, Valmy
MINE, 4 mi S of Valmy, underground, open pit, Au
(Leased to R L Brantley)

MARKER, E F
Fallon
FOURTH OF JULY MINE, Mineral Co, Au, Ag, Cu, Pb

MARSAM ENTERPRISES INC
211 S Beverly Drive, Beverly Hills, Calif
Pres: Samuel Weiler
VP: Jules Berliner
Sec Treas: Selina Weiler
Gen Mgr: F D Shuck
T BONE MINE, 9 mi S of Austin, W, vein under dev

MARSHALL MINES
Jarbridge
Gen Mgr: Wm R Marshall
O K & STARLIGHT MINES
(Leased to A M Ross)
ELKORO MINE, undgrnd, Au, Ag
(Leased to John Williams)
25-TON GRAV CYANIDE MILL

MARTIN, JD, ESTATE
1918 Fraser Ave, Sparkes
MINE, 9 mi SW of Clark Station, underground, Au, Ag
Supt: Pete Rodriguez

MARTIN, J J
Fallon
PYRAMID MINE, Churchill Co, Au, Ag

MARTIN & PAYNE
Jungo
COPPER QUEEN & RED BUTTE CLAIMS, 24 mi NW of Jungo, open pit, Cu, dev

MARY ANN PLACER MINE
Ely, Baker Stage
Owners: States, States & Green
MINE, 40 mi SE of Ely, Au, Ag

MARY ELLEN MINING CO
Hotel Nevada, Ely
Owner: Ernest R Woolley
PHYLLIS MINE, Hamilton dist, Pb, Ag

MAY DAY MINE
Orovada
Owner: J S Jones
MINE, Awakening dist

McFARLAND & HULLINGER
Montello
CLEVELAND MINE, 40 mi NE of Montello, underground, Pb, Au
DELNO MINE, 38 mi NE of Montello, underground, Cu
CORTEZ MINE, Eureka, Au, Ag
(Leased from Cortez Metals Co, N Y)

McLANE, R M
Box D, Imlay
NATCHEZ MINE, Pershing Co, Au, Ag

McNETT, IVAN
Tonopah
BLUFF & LAST ONE MINES, 70 mi from Tonopah, surface, Hg, dev

MIDGLEY, THOMAS III
Box 621, Lovelock
GREEN GOLD MINE, Pershing Co, Au, Ag

MILL CREEK COPPER CO
Mountain City
Pres: Del E Smith
Gen Mgr: H C Gorby
Supt: William N Bigg
MINE, 5 mi SW of Mt City, underground Cu, dev

MILLER & THAYER
Box 225, Ely
ANNIE MINE, White Pine Co, Ag, Pb, Zn

MILLER MT MINING CO
Star Rt, Laws, Calif
MILLER MT MINE, Esmeralda & Mineral Co, undgrnd, Pb, Zn, Ag, dev
Supt: J C Cuddeback

MILLICK BROS
Baker Stage, via Ely
YORKSHIRE PLACER CLAIM, White Pine Co, Au

MINERALS MATERIALS CO
(See Calif listing)
Lovelock
BUENA VISTA MINE, 26 mi NE of Lovelock, surface, 1000-tons
Supt: Herbert Lee

MINERS GOLD MNG CO
2189 McClellan St, Salt Lake Cty, Utah
MINERS GOLD MINE, 2 mi NW of Midas, Au, Ag

MINERVA SCHEELITE MNG CO
Ely, W

MINK, J W
560 9th St, Elko
DIAMOND COPPER MINE, White Pine Co, Cu
ROSEBUD MINE, Elko Co, Ag, Pb, Zn

MOHAWK MINE
c/o Edward R Hines, Mizpah Hotel, Tonopah
MINE, 27 mi SW of Silver Peak, underground, Zn, Ag, Au

MONTEZUMA MINE
Box 666, Goldfield
Owner: E S Giles Estate
NEW YORK & EVA MINES, Ag, Pb
(Leased to Silver King Divide Mng Co)
Gen Mgr: F A Vollmar

MORE, JIMMIE D
Box 37, Sparks
BUTTE MINE, Washoe Co, Au, Ag

MORRIS, R D
Battle Mountain
BETTY O'NEAL MINE, Lander Co, Ag, Cu, Pb

MOUNTAIN VIEW MINE
Gardnerville
Owner: Sophie M Vaccarro
MINE, Lone mt dist, Zn, Ag, Pb

MT WHEELER MINES, INC
Hotel Nevada, Ely
ST LAWRENCE MINE, 45 mi SE of Ely, undgrnd, Pb, Zn, Ag, dev
Supt: Vern E Jeppson

MUTUAL VENTURES SYND
409 Ness Bldg, Salt Lake City, Utah
Pres: O C Lyon
Gen Mgr: P C Lyon Jr
GOLD NOTE MINE, 57 mi S of Winnemucca, adit, Pb, Ag, Au, Zn, Cu, idle

NABB, T
Searchlight
RED BIRD MINE, near Searchlight, Au

NAPP, I O
Box 267, Searchlight
RED BIRD GROUP, Clark Co, Au, Ag

NATIONAL COPPERMINES INC
409 Ness Bldg, Salt Lake City, Utah
Pres: Fred Anderson
VP & Gen Mgr: P C Lyon Jr
KANSAS COPPER MINE, 24 mi NE of McGill, Cu, Ag, Au, dev
Foreman: Donald Miller

NATIONAL LEAD CO, BAROID SALES DIVISION (See Texas listing)
ROSSI MINE, Battle Mountain, open pit, Barite
Supt: R B Spitzer
(Also see South Central & Calif listings)

NATIONAL LEAD CO, TITANIUM DIVISION (See North Eastern listing)
TITANIUM REFINERY, Henderson, dev

NATOMAS COMPANY
607 Forum Bldg, Sacramento, Calif
Pres & Gen Mgr: R G Smith
GOLD PLACERS, 16 mi SW of Battle Mt, bucket-dredge
(Leased from Greenan Placers)
Res Mgr: J L James

NEEDLE PEAK FLUORSPAR
Battle Mountain
FLUORSPAR CLAIMS, 40 mi SE of Battle Mt, open pit, dev
(Leased to Ford T Frost)

NEVADA CO, THE
Austin
Pres: J G Phelps Stokes
Res Agt: N S Eaton
BERLIN MINE, Berlin, underground, Au, Ag, dev

NEVADA EQUITY MINING CO
Austin
Gen Mgr: R H Raring
NEVADA EQUITY MINE, Au, Ag, Cu, Pb, Zn, idle
Purch Agt: Marion Esobar
Supt: Elmer Snell

NEVADA-MASSACHUSETTS CO
Tungsten
Pres: C H Severstrom Jr
Supt Chg Oper: W G Emminger
TUNGSTEN MINE, open pit, W
Foreman: Eldridge Nash
400-TON MILL, grav-flot & crushing
Foreman: Phil McGuire

NEVADA METAL MINES CO
222 Atlas Bldg, Salt Lake City, Utah
Pres & Gen Mgr: H R Fisher
VP: Leon Fonnesbeck
MINE, near Imlay, Au, Ag, Pb, dev

NEVADA METALS MINING CO
202-3 Boston Blg, Salt Lake City, Utah
Pres: Samuel A Walsh
VP: S V Walsh
Sec Treas: C T Praggastis
MORNING STAR & DOTY MINES, Boone Spring, Ag, Cu, Pb, Zn, Fe, dev

NEVADA MONARCH CONS MINES
c/o H H Cazier, Wells
MONARCH MINE, Elko Co, Ag, Pb, Zn, Cu

NEVADA PACIFIC DEV CO
Box 186, Gabbs
Pres & Gen Mgr: G N Tausan
COMPANY MINE, 6 mi NE of Gabbs, underground, W dev

NEVADA SILICA SANDS, INC
Box 150, Overton
Gen Mgr: F L Morledge
SILICA MINE & NEV MILL, Overton, openpit
Supt: E V Hickman
300-TON FLOT MILL
Supt: Walter Huntsman

NEVADA SUNSHINE SILVER MINES, INC, 603 Beason Bldg, Salt Lake City, Utah
Pres: P C Reynolds
Sec Treas: E G Kidder
Geol: F F Hintze
Assay: Deason & Nichols
GRAND PRIZE MINE, Ely, Au, Cu, Pb, Zn
MONIOR, ARGUS & GARDNER MINES, Taylor, open pit, Au, Ag, Cu, Pb, Zn
Supt: S F May
Foreman: A E Potash

NEVADA TUNGSTEN CORP
Box 137, Mina
Pres: John Sinkey
EASTER BONNET, 5 mi N of Coaldale, open pit, W, dev
SILVER DYKE MINE, 12 mi SW of Mina, underground, W
SODAVILLE FLOT MILL, 3 mi S of Mina, W

NEVADA URANIUM CO
Box 653, Lovelock
Pres: Gus Rogers
VP: L C Bottomley
Treas & Gen Mgr: E J Bottomley
STAR MINE, 22 mi E of Lovelock, shaft, U

NEW STRIKE MINE
Austin
Owner: C W Meyer
MINE, Kingston dist, idle

NINETY-NINE MINE, INC
Goodsprings
Pres & Supt: A J Robbins
MINE, Goodsprings, Cu

NIVLOC MINE
c/o Edward Hines, Mizpah Hotel, Tonopah
MINE, 7 mi SW of Silver Peak, underground, Ag, Au, Pb

NOONDAY MINES, LTD
Box 71, Wells
Pres: J B White
VP & Gen Mgr: F H Crosby
Sec: N G White
NOONDAY MINE, 55 mi SW of Wells, shaft, adit, Pb, Zn, Ag, dev
NOONDAY MILL, under const

NUNN COMPANY, THE
Box 133, Overton
Gen Mgr: Paul G Nunn
MINE, open pit, silica sand
Supt: L P Keller
Engr: C L McCallum
500-TON HYDRAULIC MILL

OHIO MINES CORP
76 E McMicken Ave, Cincinnati, O
OHIO MINE, Goldpoint underground, Au, Ag
Supt: Elmer C O'Berg
CYANIDE MILL, dev

OLD BARNEY'S GOLD MINES
Searchlight
Pres: H M Morse
Gen Mgr: Roy Williams
Treas: I O Napp
GOOD HOPE MINE, Au, Ag, Pb
Supt: Roy Williams
100-TON FLOT MILL, dev
BLOSSOM MINE, Clark Co, Au, Ag

OLD ENGLISH GOLD CORP
8 W Center St, Provo, Utah
Pres & Gen Mgr: Joseph Hafen
VP: Carl J Harris
Purch Agt: Leon Newren
OLD ENGLISH MINE, Troy Canyon, underground, Au, idle
Supt: Owne Peterson
30-TON FLOT MILL

ORNELAS & HOLLODAY
Tonopah
TONOPAH BELMONT MINE, Nye Co, Au, Ag, idle

ORPHAN, CHRIST
Box 1203, Ely
GOOD LUCK MINE, White Pine Co, Ag, Cu, Pb, Zn

PABCO PRODUCTS, INC
Box 1546, Henderson
WHITE EAGLE PIT MINE, 6 mi N of Henderson, open pit, Gypsum
MILL

PACIFIC BUTTE MINES
c/o W B Naismith, Tonopah
MONTEZUMA MINE, Esmeralda Co, Au, Ag, Pb
EVA MINE, 35 mi S of Tonopah, underground, Pb, Ag, Au
NEW YORK MINE, 29 mi W of Goldfield, und grnd, Pb, Ag, Au
Mgr: Fred Vollmar

PAHRANAGAT LAKE MNG CO
c/o Tom Beard, Box 1801, Las Vegas
ILLINOIS MINE, Lincoln Co, Ag, Cu, Pb

PAINE & SINTON
Ruth
HAYES MINE, White Pine Co, Au, Ag, Cu

PANSY LEE MINING CO
Box 733, Winnemucca
Operator: R C Hanford
PANSY LEE & W COAST MINES, 11 mi NW of Winnemucca, undgrnd, Au, Ag, Pb

PAYMASTER MINE
Battle Mountain
Owner: Paul C Christopher
MINE, 19 mi SE of Battle Mt, underground, Ag, Au, Pb, idle

PEER, GALE G
Eastgate via Fallon
ORO PLATE MINE, Churchill Co, Au, Ag, idle

PEER & PEACOCK
Austin
GARNETTE MINE, Reese R dist, Lander Co, W

PETERSON, G A
Box 230, Mina
NEW POTOSI MINE, 25 mi S of Mina, underground, Pb, Sb, Ag, Au
Supt: Harvey Hunter

PETERSON MNG & MLG CO
Austin
Owners: Peterson & Fisher
MINE, Lander Co, Mn

PETERSON & PRATER
Box 22, Gabbs
Owner: Helen Prater
LITTLE JIMMIE MINE, Mineral Co, Ag, Cu

PETERSON, W S
Sulphur
STREETER MINE, 4 mi E of Sulphur, open pit, S
SULPHUR MILL, S

PHILLIPS, EDWARD H
Box 653, Broken Hills
ILLINOIS & LODE MINES GROUP, 12 mi N of Gabbs, Pb, Zn, Ag, Au
under dev

PORTLAND MINE & LAUGHTON & CAUSTEN MILL
Box 114, Lovelock
MINE 25 mi N of Lovelock, underground, Au, Ag
Lessee: Earl Tucker

POSTON BROS
Kalispell, Montana
Placer ground in Rosebud dist of Northern Pershing Co, Nev, includes portion of Rosegold Placers, Inc, Au, W, Sn
Operators: R L Schneider & U L Poston

PRIESTER, OSCAR
Tonopah
UNLUCKY CLAIM MINE, Nye Co, Au, Ag

PRINCE CONSOLIDATED MINING CO
618 Kearns Bldg, Salt Lake City, Utah
Pres, Gen Mgr & Dir: David L Gemmill
Purch Agt: J B Whitehill
PRINCE MINE, Zn, Pb, Au, Ag
Mine Supt: D J Jackson
Engr & Geol: Paul Gemmill
Elec: S L Mahaffy
2,500 tons prod monthly

PROUD, IRA
Box 107, Goodsprings
SANDY VIEW LEASE, 20 mi SW of Goodsprings, underground, Zn, Pb
dev

RARE MINERALS MINING CO
Box 505, Sparks
Pres & Gen Mgr: J T Collins
Sec: F Steele
BALD EAGLE GYPSUM MINE, Clark Co, open-pit, Gypsum
Mgr & Engr: C Noble
Mine Supt & Mech Engr: W C Kruger
300 tons prod

RAYMOND ELY WEST MINING CO
P O Box 837, Salt Lake City, Utah
Pres: J M Bamberger
RAYMOND ELY MINE at Pioche, Pb, Zn
Idle

RED HILL FLORENCE MINING CO
Goldfield
Pres & Treas: Frank J Friday
VP: J W Boesch
Sec: A Frank, Tonopah
Gen Mgr: William J Frank, Tonopah
FLORENCE MINE, 1 mi E of Goldfield, vein dev by shaft,
Idle
TONOPAH TUNGSTEN MINE, 8 mi N of Tonopah, W, vein under dev by shaft

REGAN, JOHN
Mason
SANTA CRUZ & EMPIRE MINE, Mineral Co, Ag, Pb, Zn

REORGANIZED SILVER KING DIVIDE MINING CO
Box 357, Austin
Supt: Burhl Dykhouse
THOMAS W GOLD BELT MINE, 34 mi NW of Austin, underground, Au, Ag, Pb
60-TON GRAVITY-FLOT MILL

REVILLE LEAD MINING CO
Box 172, E Ely, Nev
Pres & Gen Mgr: F Farnsworth
Dir: H M Johnson
Mgr: Wayne Cole
REVILLE LEAD MINE, W Reville, underground, Au, Ag, Pb, Zn
Purch Agt: H W Young
Mine Supt: W Cole
Asst Mine Supt: Nelda Cole
Engrs: F W Millard & Son
Assy: M Pray
50 ton daily prod

REYNOLDS SAND & GRAVEL CO
Imlay
LAST CHANCE MINE, Pershing Co, Au

RICE, JEFF & FRANK E WYCKOFF
Box 882, Winnemucca
RIO #1 & 2, Au, Ag

RICE, OWEN
Eureka
DOE RUN MINE, Eureka Co, Ag, Pb

RIECK & NELSON
Battle Mountain
Pres: H R Rieck & Estate of A J Nelson
SILVER CHIEF GROUP, 8 mi NE of Battle Mt, underground, open-pit, Au, Ag, Pb
Under dev

RIP VAN WINKLE CONSOLIDATED MINING CO
Box 1850, SaltLakeCity, Utah
RIP VAN WINKLE MINE, Elko, Au, Ag, Pb, Zn
125-TON FLOT MILL
Mine being worked under lease

ROBISON, SAM M
Box 1288, Ely
Gen Mgr: Sam M Robinson
COLUMBIA MINE, 1 mi E of Ruth, underground, open-pit, Zn, Pb, Cu, Au, Ag, Mn
200 tons prod monthly

ROCHESTER CONS MINES CO
Box 521, Lovelock
ROCHESTER MINES, underground, Au, Ag
Supt: M E Hannon
Engr: L B Wright

ROGERS & GEIGER
c/o Gus Rogers, Winnemucca
ANTELOPE SPRINGS MINE, Pershing Co, Ag, Cu, Pb, Zn
Supt: J E Bottemley

ROMANO, TONY
Austin
Gen Mgr: Tony Romano
ANTIMONY MINE, Austin, Sb, Au, Ag

ROMERO, FRANK
Overland Hotel, Elko
TOP LEAD MINE, Elko Co, Ag, Pb

ROOT ZINC LEASE
Box 156, Goodsprings
Gen Mgr: R K Hamilton
Supt: L F Jacobson
BOSS, PILGRIM, ROOT & YELLOW PINE MINES, Ag, Pb
Engr: Roy Cross
Foreman: R H Reed
75-TON GRAV MILL
Foreman: O F Schwartz

ROSEN CRANS Mn-W MINE
Pioche
Pres: Urban Cole
Gen Mgr: J G Hulse
DEMOCRACY MINE, 47 mi N of Pioche, underground, Mn, W, dev
Met: J W Cole

ROSS, A M
Jarbridge
STARLIGHT MINE, Elko Co, Au, Ag

ROSS & BOWMAN
Lovelock
Owner: Nevada Gold Mines Co
ROUGH LOCK & LOOK OUT MINES, fractions, Pershing Co, Au, Ag

ROUND MT GOLD DRG CORP
351 Calif St, San Francisco, Calif
Pres: F C Van Deine
VPs: W C Browning, Hugh Rose
Sec Treas: P C Knapp
ROUND MT MINE, open pit, placer, conveyor to wash pl, 20,000 tons
Mgr: F M Jardine
Foreman: J C Perkins
Expir Engr: T M Canill

RUBY, GEORGE E
Manhattan
JOHNNIE TOWN MINE, Nye Co, Au

RUSSELL, ALLEN A
RR Mill Canyon, Beowawe
BERLIN TUNNEL MINE, Eureka Co, Ag, Pb

RUTH ELDER MINING CO
Box 156, Searchlight
Owner: Willett Barton
RUTH ELDER MINE, 2 mi N of Searchlight, underground, Au, Ag, Dev

ST LAWRENCE MINE
803 Wilder Bldg, Rochester, N Y
Pres: Mr Dinkey
Sec: Ellsworth Nichols
MINE, 49 mi SE of Ely, underground, Pb, Ag, dev
(Leased to Robinson, Cotins & Hulse)

SALT LAKE-PIOCHE MNG CO
440 54th W, Salt Lake City, Utah
Pres: N H Martin
VP: L W Hillan
Sec: O H Martin
APEX & FINANCIER MINES, 1 mi SE of Pioche, Au, Ag, Pb, idle
Supt: A A Stephens

SANDQUIST, E
Searchlight
SOUTHERN NEV & VICTORY CLAIMS, Clark Co, Au, Ag

SANFORD, M J
Lee
AMERICAN BEAUTY MINE, Ag, Pb

SCHAPPER, D S
Imlay
RIVERVIEW PLACER, Pershing Co, Au

SHULTZE CLAIM
Beowawe
SHULTZE MINE, 35 mi S of Beowawe, underground, Ag, Pb, Au, Zn
SMELTER, 50-tons monthly

SCHWEISS, FRANK, EST
Eastgate via Fallon
GOLD LEDGE GROUP, Churchill Co, Au, Ag, idle

SEABISCUIT MINE
Box 34, Goodsprings
MINE, Yellow Pine dist, Pb, Zn
Leased to Thos J Hammons

SEARCHLIGHT CONS MNG & MLG
Las Vegas
BLOSSOM MINE, Clark Co underground, Au, Ag

SEARCHLIGHT HOMESTAKE MINING CO Box 65, Searchlight
Pres: F C Moore
QUARTETTE MINE 1 mi S of Searchlight, underground, Au, Ag, Cu, Pb
Supt: F C Moore Jr

SEGERSTROM, HEIZER & DODGE CONST, INC Lovelock
Gen Mgr: J M Heizer
IRON MINES, open pit, truck, Fe
700-TON CRUSHING & SCREENING PL
SUTHERLAND MINE, 15 mi NE of Lovelock, Sb, dev, 30 tons
HOLLYWOOD MINE, 30 mi NE of Lovelock, underground, Sb 25 tons
Supt: Fred Johnson

SELIG, A & R
Manhattan
SUNSHINE & GOLDEN FLEECE MINES, Nye Co, Au, Ag, idle

SELIGMAN LEAD-ZINC MINE
Box 188, Ely
Owner: Pat Fraser & Sons
MINE, 61 mi W of Ely, underground, Ag, Pb, Zn, dev

SHAW, CLARK C
662 Humboldt St, Fallon
CAMP TERRELL CLAIMS, Churchill Co, Ag, Au, Pb idle

SHAW, LLOYD
662 Humboldt St, Fallon
ANGLO-SAXON MINE, Churchill Co Au, Ag, idle

SIERRA MAGNESITE CO
Newark, Calif
Pres: M Y Seaton
Dev Mgr: J B Perry
SEGERSTROM MINE, Gabbs, $MgCO_3$
Supt: H J Tillia
Foreman: Rae Swindlehurst

SIERRA TALC & CLAY CO
(See Calif listing)
OASIS MINE, 55 mi SW of Goldfield, underground, Talc
Supt: F A Bachich
Engr: D B Kempfer

SIMPLOT, J R, CO
(See Idaho listing)
SIMPLOT IRON MINE, Palisade, underground
Gen Mgr: George McHugh

SINGAYZE SYNDICATE
Wabuska
MINE, open pit, Perlite, dev
Mgr: H J Penrose

SIRI & GUBLER
Box 532, Ely
GREAT VALLEY MINE, 45 mi W of Ely, underground, Pb, Ag, Cu, idle

SKY LINE ANNEX MINE
Box 1042, Tonopah
Operator: L B Sammons
MINE, 18 mi W of Tonopah, underground, Pb, Zn, Cu, dev

SNO-LITE PRODUCTS CO
Box 58, Reno
Pres: C J Catron
PERLITE PL, Comstock Drive, Reno

SOUND STATE METALS INC
Box 457, Reno
Pres: Joseph Hornstein
Gen Mgr: F E Anderson
LONE PINE & COLUMBIA MINES, Muncie Cr, undergrnd, Ag, Pb, idle

SOUTHWEST DREDGING CO
Box 545, Lovelock
Mgr: R H Pfeffer
SPRING VALLEY & BONANZA MINES, placers, Humboldt Co, Au

SPAULDING MINES, INC
134 Kendall St, Winnemucca
Pres: B W Andresen
SPAULDING CANYON PLACER, 40 mi SW of Winnemucca, Au, dev

SPEZZI, RAYMOND A
Mason
MASON VALLEY MINE, Lyon Co, Cu

STANDARD SLAG CO
Box 3, Gabbs
Pres: L A Beeghly
VP: W E Bliss
Sec Treas: W H Kilcawley
Mgr: R O Jones
GREENSTONE MINE, 2 mi E of Gabbs, open pit, Magnesia, 100 tons
Supt: F W Reinmiller
GREENSTONE MILL, Calcining
Supt: S V Wines
STOKES MINE, 8 mi NE of Gabbs, Fe, open pit, dev
Supt: P W Reinmiller

STEWART, H N
Cornell St, Big Pine, Calif
HIDEOUT MINE #1, 45 mi SW of Goldfield, open pit, talc

STOCKHOLM MINE
Elite Motel, Ely
Contractor: O T Marks
MINE, 2 mi W of Hamilton, undergrnd, Cu, Ag, dev

STRAND, WILLIAM
690 Wildes St, Fallon
RAWHIDE TUNGSTEN MINE, 2 mi NE of Rawhide, underground W, dev

STREETER, O J
Box 485, Elko
SUMMIT VIEW MINE, Elko Co Ag, Pb

SUMMIT KING MINES, LTD
Box 632, Fallon
Pres: Ira B Joralemon
SUMMIT KING MINE, 31 mi E of Fallon, underground, Au, Ag, idle
Gen Mgr: Percy G Dobson
Supt: Frank Kennicott
70-TON CYANIDE MILL
Supt: R L Clawson

SUMMIT QUEEN MINING CO
Box 2044, Reno
Pres & Gen Mgr: S G Baker
VP: Nello Gonfiantina, Jr
Sec Treas: Harry Baer
HONOLULU MINE, 30 mi E of Fallon, idle

SUSMILL, JACK
Battle Mountain
HUMBOLDT COPPER MINE, Humboldt Co, Ag, Cu

SWANSON, H B
Hawthorne
THE LITTLE HILL MINE, Mineral Co, Au, Ag

SWEETWATER MINING CO, INC
Topaz, Calif
Pres & Purch Agt: P R Leitzell
VP: L M Leitzell
Sec Treas, E W Witt
SWEETWATER MINE, 8 mi NE of Coleville, Calif, Au, Cu, W, Mo, idle
Supt: W B Hererling

TANNER, B L
Box 37, Searchlight
SEARCHLIGHT INSUL PROD MINE, 7 mi NW of Searchlight, open pit, perlite
MILL

TENABO MNG & MLG CO
Box 1186, Elko
Pres: O W Terry
VP & Gen Mgr: L B Walbridge
PROPERTIES leased to Interstate Oil & Dev Co

TEXAS #2 MINE
c/o Ray B Clemmons, Wadsworth
MINE, Au, Ag

TONOPAH DIVIDE MNG CO
426 First Nat'l Bank Bldg, Reno
VPs: H H Luce, W E Sirbeck
Sec Treas: R M Erickson
DIVIDE MINE, 6 mi S of Tonopah, underground, Au, Ag, idle

TRADER HORN MINE
Tonopah
Mgr: J V Grismer
TRADER HORN MINE, Tonopah, Au, Ag, idle

TREASE, A J
Box 1065, Wallace, Idaho
LITTLE BELMONT MINE, Mineral Co, Ag

TUNGSTEN KING MINE
Box 654, Tonopah
Mgr: George Wilmot
MINE, 30 mi NW of Round Mt, underground, W

TUNGSTEN PRODUCERS INC
Box 164, Mina
Agt: C F Noble
BLUE JACKET MINE, 9 mi SW of Luning, undgrnd, W

TURK, FRANK
Box 161, Ruth
KING MINE, White Pine Co, Ag, Pb, Zn

TWILIGHT GOLD MINES, INC
153 N Virginia St, Reno
Gen Mgr: Albert Silver
TWILIGHT GOLD MINE, 30 mi E of Fallon, underground, Au, Ag, idle
Foreman: George Frasher

TWIN BUTTES MINE
Lovelock
MINE, Au, Ag, Pb, diamond drill explr work, E Heinke

UNITED MINERALS RES CORP
(See Utah listing)
LUCKY STRIKE MINE, Battle Mt, underground, Zn, Pb, Ag, Au, Cu
Supt: Glenn Johnson
RIP VAN WINKLE MINE, Elko, underground, Zn, Pb, Ag, Au, Cu
Supt: Lowell Thompson
RIP VAN WINKLE MINE MILL, Elko, idle
(Also see Idaho listing)

U S GYPSUM CO
(See North Central listing)
GYPSUM MINE, Empire, open pit

VALENTE, JOHN
Pioche
WOOD BUTCHER MINE, Lincoln Co, underground, Au, Ag, Pb

VALLEY MINE
Las Vegas, Au, Ag
Operators: Morse & Graves

VALLEY VIEW MINING CO
Box 413, Ely
Pres: F C Horlacher
VP: Alex Nibley
Gen Mgr: C A Gardner
VALLEY VIEW MINE, 20 mi E of Ely, underground, Ag, Pb, Zn, idle

VALLEY VIEW MINE
Box 662, Winnemucca
MINE, 28 mi NE of Golconda, open pit, W, (Leased to Spitzer, Etchart & Hosking)

WAR EAGLE GROUP
Box 488, Tonopah
Owner: W A Flower
GOLD CLAIMS, Meadow Canyon, 60 mi N of Tonopah, dev

WARD LEASING CO
1811 S 7th East St, Salt Lake City, Utah
Pres & Gen Mgr: L N Rasmussen
CHIEF CONS MINE, Hamilton, Mn
Supt: L J Price

WARTIG, EDGAR
Denio
COPPER SHAFT MINE, Humboldt Co, Ag, Cu

WESTERN DUKE MINE
Box 724-8, Hawthorne
Operator: J H Lightfoot

WESTERN NEV COPPER MINE
Box 46, Mason, Cu, Au
Gen Mgr: Leo Mason

WESTERN STATES METALS
Winnemucca
GEORGE & CHARLIE MINE, 40 mi NE of Winnemucca, undgrnd, open pit, Mn
Mgr: Warren R Clark

WHITE CAPS GOLD MNG CO
Tonopah, Sb

WOOD, DAVID G
Box 58, Gardnerville
LASTLAUGH MINE, 8 mi from Gardnerville, underground, W dev

WILLARD LEASING CO
Box 486, Ely
Mgr: Caesar Caviglia
WILLARD MINE, E of Ruth, undgrnd, Zn

WILSON, A C
Box 25, Silver City
MAY DAY MINE, Ormsby co, Ag, Pb

WINNEMUCCA MT MINES CO
Box 31, Winnemucca
Pres: O R Manunla
VP: Fred Sims
Gen Mgr & Purch Agt: Gus Rogers
REXALL GOLD HILL & GOLD HILL TUNGSTEN MINES, 3 mi N of Winnemucca, open pit, Au, W, dev
Supt: Elmon C Griffiths
50-TON AMAL MILL, conv to W
Supt: Bert Clark

WONDER MT MINES, INC
109 S 3rd St, Las Vegas
Pres & Gen Mgr: L G Blakemore
CAL-NEV MINE #1, Box 54, Goodsprings, Au, Ag, Pb, Zn, dev
Supt: L G Blakemore

YELLOW GOLD MINE
Beatty
YELLOW GOLD MINE, 20 mi NE of Beatty, underground, Au
Leased to Borneman, Walling & Hawkins

YELLOW PINE MINE
Goodsprings
MINE, 5 mi W of Goodsprings, underground, Pb, Zn, dev
(Leased to L F Jacobson)

ZENDA GOLD MINING CO
Las Vegas
Pres: R T Whiting
VP: B M Snyder
Sec Treas: James Boyle, Suite 306, Wm Fox Bldg, Los Angeles, Calif
Gen Mgr: N C Stines
(See Utah & Alaska listings)

NEW MEXICO

AMERICAN SMELTING & REFINING CO, (See Northeastern)
SOUTHWESTERN DIVISION
813 Valley Nat'l Bank Bdg, Tucson
Mgr: F V Richard
Ch Geol: L K Wilson
GROUND HOG UNIT, Vanadium, N M underground, Pb, Zn
Supt: T A Snedden
DEMING MLG UNIT, 600-ton selective flot pl, treating Ground Hog & custom
Supt: T A Snedden
Engr: H W Kaanta

ANITA MINE
Lordsburg
Operators: Harrison & Walker
MINE, Hidalgo Co, idle

ATWOOD COPPER MINES
Box 636, Lordsburg
Gen Mgr: C H McIntosh
ATWOOD MINE, 3 mi S of Lordsburg, shaft, Cu, Au, Ag, Pb

BANNER MINING CO
1910 First Nat'l Bank Bldg, Oklahoma City, Okla
Pres: H I Grimes
VP & Gen Mgr: E S Bowman
Sec Treas: W H Hardy
BANNER MINE, 4 mi S of Lordsburg

BONNEY-MANILA & MISER'S CHEST MINES
Lordsburg
Gen Supt: E S Bowman
Office Mgr: E C Bowman
MINE, Cu, Ag, Au
Foreman: Coleman Dunkerson
Engr: B W Venable
500-TON FLOT MILL
Foreman: Geo Stone
Met: D M Reck
Prod: 6,000 tons monthly

BRANNER & PATTON
Bayard
LAST CHANCE MILLSITE MINE
50-TON MILL

CATRON, C C
Santa Fe
JUANITA MINE, Cobb & Thurmond, Magdalena, (Lessee)

DENVER MNG & MLG CO
Cerrillos
Gen Mgr: W J Roberts
CASH ENTRY MINE, near Cerrillos, underground, Pb, Zn, idle

DRUNZER & CASNER
Box 307, Santa Rosa
Pres: Montgomery Drunzer
VP: R S Casner
Gen Mgr: Quentin Drunzer
STAUBER MINE, 15 mi SW of Santa Rosa, open pit, silicious Cu flux
Engr: M F Drunzer
Idle

DUVAL SULPHUR & POTASH
(See South Central listing)
Box 510, Carlsbad
Gen Supt: W P Morris
Purch Agt: J R Smith
MINE, 21 mi E of Carlsbad, shaft, Potash
Supt: J E Tong
Foreman: J J Gasparich
Engr: B G Messer
FLOT MILL
Supt: G EAtwood
Foreman: I B Phillips

ELAYER & CO
Silver City
Pres: C S Elayer
Gen Mgr: W R Jenks
LYNCHBURG MINE, Magdalena, underground, Pb, Zn, Cu, 100 tons

ELECTRA MINES, INC
Box 242, Truth or Consequences
Pres: Blanchard Hanson
VP: J P Flake
Sec: M E Conkling
IMPERIAL MINE, 6 mi S of Truth or Consequences, adit, Fluorspar, Pb
FLOT MILL

EL ORO MINE
Hillsboro
Operators: E W Davis & A C Hibner
MINE, 9 mi NE of Hillsboro, shaft, Au, Ag, Cu

EMPIRE ZINC CO
(Subsidiary, New Jersey Zinc Co)
160 Front St, New York 7, N Y
Pres: Henry Hardenbergh
Gen Mgr Mines: R L McCann
Purch Agt: W J Lee
Gen Supt: F J Maloit
KELLY GROUP (Leased to J ETorres, Magdalena)
LYNCHBURG GROUP (Leased to Elayer, Jenks, Kessey & Richmond, Magdalena)
KINGSTON GROUP (Leased to T B Everheart, Box 51, Socorro)
HANOVER MINE, Hanover, Pb, Zn
Supt: S S Juyett
300-TON FLOT MILL

EXPLORATIONS, INC
Silver City
ROYAL JOHN MINE, Grant Co

FOSTER & ROGERS
Duncan, Ariz
ALABAMA GROUP, Grant Co

FULLER & ASSOCIATES
Lordsburg
WALDO MINE, 2 mi S of Lordsburg, underground, Pb

GENERAL CHEMICAL DIV,
Allied Chemical & Dye Corp
40 Rector St, New York, N Y
Pres: H O C Ingraham
VP: M M Biddison
Dir Mng Oper: R H Dickson
Gen Supt: Wilbert J Trepp
DEMING MINES, Box 631, Deming, 85 mi N of Deming, Shaft, Fluorspar
Foreman: Chas Gardner
FLOT MILL, Deming
Foreman: F F Faulkner

GREAT LAKES CARBON CORP
18 E 48th St, New York, N Y
Pres: Geo Skakel
VP, Perlite Div: Geo Skakel Jr
Operational Mgr: E A Harris
MINE, Box X, Socorro, 4 mi W of Socorro, open pit, Perlite
Supt: W D Stone
Foreman: Jerry Howell
MILL, Socorro

GREAT WESTERN MNG CO,
MICA DIVISION, Box 930, Las Vegas
VP: A H Miller
Sec Treas: Robert Katson
Gen Mgr: J M Haberl
MINE, Mora, open pit, Mica
200-TON MILL, Mora

HAMMER & HOUSER
Organ
MEMPHIS KING MINE, Organ, underground, U, dev
H & H BERYL PROSPECT, 8 mi NE of Memphis King, rare earths

HURLOW MNG & MLG CO
Box 398, Bingham
Gen Supt: J F Lower
MAJOR JONES MINE, Barite, Fluorspar, Pb
MILL, Hansonberg mng dist

INTERNAT'L MINERALS & CHEMICALS CORP
(See North Central listing)
POTASH MINES, Carlsbad
Mgr: G T Harley
Asst Mgr: C A Arend
Purch Agt: J F Farrell
Mine Supt: M W Karchner
Engr: H L Gardner
Maint Fore: E A Chowning
Foremen: W F Ecklund, C E Wiley
Met: H P Clark Jr
Elec: J W McCroskey
Chem: L E CuPont
Prod: 750 tons

IRVIN & BISHOP
San Antonio
MINES, Hansonberg dist, Barite
MILL, 1 mi S of San Antonio, Barite, Pb

KELLY MINE LEASE
Magdalena
MINE, Kelly, Magdalena, undergrnd, Ag, Pb, Zn
(Leased to J D Torres)

KENNECOTT COPPER CORP
(See North Eastern listing)
CHINO MINES DIVISION, Hurley
Gen Mgr: W H Goodrich
Asst Gen Mgr: F C Green
CHINO MINES, Santa Rita, shaft, Cu, Zn
Supt of Mines: G J Ballmer
Asst Supt: W E Herkenhoff
Gen Mine Fore: K V N Harris
Geol: William Baltosser
Mech Engr: D G Thorne
Prod: 22,500 tons
CONCENTRATOR & SMELTER
Mill Supt: E ASchroer
Asst Supt: W J Akert
Smelter Supt: E A Slover
Asst Supt: W H Winn
Smelter Fore: Frank Brown
Mast Mech: T J Hubbard
Purch Agt: A L Burns
Met: B C Jacobs

KIRK'S PERLITE INDUST
Box 576, Lordsburg
Owner: Marshall Kuykendall
AMBER PEARL MINE, 12 mi S of Lordsburg, open pit, Perlite

LATHAM & CHENOWTH
Box 785, Hot Springs
Pres & Gn Mgr: A H Latham
VP: R G Chenowth
SALINAS MINES, 55 mi From Hot Springs, undgrnd, Pb, Barite, Fluorspar

LITTLE GIRL MINING CO
Hillsboro
Pres: J S Wade
Mgr: E B Paxton
LITTLE GIRL & BLACK PEAK MINES, undgrnd, placer, Au, Ag, Cu, Bi
5-TON GRAV MILL

LUCK MNG & CONST CO
Box 29, Silver City
Gen Supt: J Hutchins
BOSTON HILL MINE, Grant Co, open pit, Fe, Mn

MacDONALD & DOBSON
Box RR, Magdalena
Gen Mgr: J A MacDonald
Purch Agt: W R Dobson
NITT MINE, 3 mi SE of Magdalena, underground, Zn, Cu, Pb, Ag

MALONE DARHASANA MNG CO
Box 203, Lordsburg
Pres: C Fridericksen
MINE, Grant Co, idle

McCRAY, H E
Deming
GREENLEAF & VALLEY MINES, near Deming, shaft, fluorspar, Pb, Zn
Supt: Ralph Barr

McGHEE, DONALD & CO
Lordsburg
McGHEE MINE, 25 mi SW of Lordsburg underground, Pb, Zn, Ag, Co, Au
75-TON MILL, idle

McLENDON, C T
Bayard
BEN HUR MINE, Grant Co, idle

MELVA MINES CO, INC
Box 604, Socorro
Gen Mgr: Nick Sapanas
MELVA MINE, Au, Ag

MERRIMAC MINES
Box 106, Organ
Operators: Ira Wright & Assoc
MERRIMAC MINE, 14 mi E of Las Cruces, Pb, Zn

METALS LTD of MILL CANYON
Box Y, Magdalena
Gen Mgr: Frank L Maher
H M METALS MINE, 12 mi SW of Magdalena, underground, Au, Ag, Cu, Pb, Zn
Geol: Seymour Thurmond Jr
15-TON GRAV FLOT MILL, idle

MEX-TEX MINING CO
San Antonio
MINES, Hansonberg, Pb, Barite
MILL, near San Antonio

MINERALS OPER, INC
Box 56, Hachita
Mgr: C J Vezzetti
HORNET MINE, Grant Co

MOCKING BIRD MINING CO
204 E 2nd St, Portales
Gen Mgr: Paul Ridings
MOCKING BIRD MINE, 18 mi S of Bingham, shaft, surface, Pb, Zn, idle

MOLYBDENUM CORP OF AMER
(See North Eastern listing)
Questa
MOLY MINE, 7 mi E of Questa, adit, Molybdenite
Cons Engr: O R Whitaker
Gen Mgr: A L Greslin
Supt: Jose Varela
200-TON FLOT MILL
Supt: Robert Creel

MONTGOMERY, ARTHUR
Dixon
HARDING MINE, 5 mi E of Dixon, undergrnd, open pit, non-metallics
Supt: Flaudio Griego

MONTGOMERY MINE
Gen Del, Lordsburg
Owner: R A Custer
MINE, shaft, adit, Ag, Cu, Pb, idle

MUDRITE CHEMICALS
Box 590, Hatch
Owner: J W O'Brien
PLAM PARK & HATCH EXT open pit, Barite, grav operations
Foreman: Wayne Kemper

NEW JERSEY ZINC CO
160 Front St, New York, N Y
CLEVELAND MINE, Pinos Altos dist, Au, Ag, Cu, Pb, Zn
(Leased to D B White, Silver City)

NEW MEXICO COPPER MNG CO
Box 56, Carrizozo
Pres: C E Degner Sr
VP: Jack Diamond
Sec: B W McGinnis
CONQUEROR RIO TINTO MINES, 10 mi SE of Corona, Cu, Pb, Ag, Fluorspar, Bastnasite
SURPRISE PARK MINES, 11 mi SE of Carrizozo, Cu, Ag, dev
Supt: Jack Payne
Asst Supt: G E King

NEW MEXICO MNG & CONTR CO
Dixon
Pres: C J Barnhisel
VP: John Wood
Sec Treas: E P Chapman, Jr
CONTRACT MINING, Harding Mine, open pit, Lepidolite, 200 tons month

NIGHT HAWK
c/o Latham & Chenowth, Box 785, Hot Springs
MINE, Engle, Au, Ag, Cu, Pb, Zn

ONTARIO MINE
Box 105, Duncan
Owners: Billingsley Bros
MINE, NE of Duncan, Ariz, Au, Ag, Pb, Cu, idle

OZARK-MAHONING CO
(See South Central listing)
Purch Agt: J L Cadden
FLUORSPAR MINES, Deming
Supt: R F Hickman

PALOMAS CHIEF MINES
Box 97, Winston
Pres & Gen Mgr: A W Emerick
PALOMAS CHIEF MINE, Winston, underground, Au, Ag, Cu, Pb, Zn, idle
Engr: L B Fargo
Supt: Edward R Armour
Asst supt: A W Messee

PAPA, MRS SADIE
Magdalena
QUEEN GROUP MINES, Socorro Co

PARK, JA
Duncan
CARLISLE MINE, 16 mi E of Duncan, Pb, Zn, Ag, Au, 90 tons
125-TON FLOT MILL

PENNSYLVANIA MINE
Box 1361, Santa Fe
Gen Mgr: Verne Byrne
PENNSYLVANIA MINE, 20 mi S of Santa Fe, shaft, Zn, Pb, Ag, Cu, Au
Supt: R W Leigh

PERU MINING CO
Box 309, Silver City
Pres: J A Hill
VP: Jos Taylor
Asst Mgr: J W Faust
PEWABIC GROUP, COPPER FLAT, KEARNEY GROUP, Grant Co, Au, Ag Cu, Pb, Zn
DEMING MILL, 1000-ton, flot

PERSHING MINE
Box 1657, Lubbock, Tex
Owners: Dr & Mrs R S Pershing
MINE, 22 mi from Capitan, Au, Ag
Foreman: E W Purcella
250-TON AMAL MILL

PHELPS DODGE CORP
(See North Eastern listing)
BURRO MT BRANCH, Tyrone idle
Agt: John F Stock

PINOS ALTOS MINING CO
Box 612, Silver City
Pres: Mrs L B Read
Gen Mgr: C A Howe
Mgr: Loren F Read
LANGSTON MINE, underground, Au Ag, Cu, idle
Supt: John Fagetti
100-TON FLOT MILL

PORTALES MINING CO
204 E 2nd St, Portales
Gen Mgr: Paul Ridings
PORTALES MINE, 5 mi S of Bingham, open pit, Pb
Supt: Fred Brackeen
150-TON GRAV MILL, Box 741, Socorro
Supt: G G Blund

POTASH CO of AMERICA
Box 31, Carlsbad
Pres: G F Coope
VP & Treas: F O Davis
Office Engr: P E Schreiner
Research Dir: E W Douglass
MINE, 23 mi NE of Carlsbad, Potassium Chloride
Res Mgr: R G Haworth
Purch Agt: C E Bothwell
Mine Supt: R R Knill
Refin Supt: A J Weinig Jr
Pl Engr: R R Dabney
FLOT MILL

PROSSER, D E
Silver City
MINES, Pinos Altos dist, underground, Pb, Zn, Cu, dev

PUMICE CORP of AMERICA
Box 216, Grants
Pres: C E Clark
VP: Harold G Robinson
Gen Mgr: J A Freeman Jr
MINE, 8 mi NE of Grants, open pit, Pumice
Supt: Johnny Matkovich
Asst Supt: N E Neff
Mill Supt: Joe Hoisington
Mill Foreman: Refugio Garcia

Q B Q CO, INC
Box 248, White Oaks
Gen Mgr: D J Queen
Gen Supt: F J Queen
OLD ABE & NORTH HOMESTAKE MNS, Lincoln Co, underground, Au, W

RED HILL MINING CO
Hachita
RED HILL GROUP, idle

ROYAL FLUSH MINING CO
Bingham
Owner: Tom Franklin
MINE, Au, Ag, Cu, Pb, Zn idle

SAN MIGUEL MINE, MLG & SMELTING CO, Box 574, Las Vegas
Gen Mgr: C R Crager
SUNSHINE MINE, open pit, Mica

SANTA FE LEAD-ZINC MINES
Santa Fe
Mgr: Tom Payne
MINE, Cerrillos dist

SANTA FE PACIFIC RR CO
80 E Jackson Blvd, Chicago 4, Ill
Pres: F G Gurley
VP: R G Rydin
Sec Treas: C A Menninger
HAYSTACK MT MINE, 6 mi NE of Prewitt, surface, U, dev
Gen Mgr: T O Evans
Purch Agt: W W Kelley
Supt: J E Inman
Asst Supt: R M Larsen
Engr: Everett Zwicky

SHATTUCK DENN MINING CORP
120 Broadway, New York 5, N Y
Pres: Thomas Bardon
Sec Treas: Norman E Lamond
ZUNI MLG CO, Box 1304, Albuquerque
Mgr: G A Warner
Ch Clk: W F Caley
FLUORSPAR MINE, near Grants
Supt: J H Mallery
FLUORSPAR MILL, Los Lunas
Supt: Coyte Hunt
Met: W W Fowler
Prod: 200 tons

SILVER DOLLAR MINE
Box 576, Lordsburg
Owner, Marshall Kuykendall
SILVER DOLLAR MINE, 25 mi N of Lordsburg, underground, Au, Ag, Pb, W, idle

SILVER HILL MINING CO
Lordsburg
Mgr: L A Whelan
SILVER HILL MINE, Hidalgo Co, San Simon dist

SOCORRO CORP
Albuquerque
Pres: John Emmons
Mgr: G E Tatman
HUNTINGTON MINE, Socorro, underground, Mn

STRONG & HARRIS
Vanadium
MILL SITE MINE, 2 mi S of Lordsburg, underground, idle

TAFOYA, FIDEL & DAVID
Magdalena
JUANITA MINE, Au, Ag, Cu, Pb, Zn

TELLEZ, ARCADIE M
Box 114, Hanover
BETTY JOE MINE, Grant Co, Pb

TERRY, H W
Monticello
MINE, 2 mi E of Monticello, open pit, U, dev

THOMPSON, ROBERT P
Tyrone
MINE, near Tyrone, Fluorspar, dev

TIDWELL, CLARENCE
Bayard
PATSY MINE, Grant Co

TORPEDO MINING CO
Organ
Pres: A S Putney Jr
VP: L B Bentley
Sec: Edwin Mecham
TORPEDO, MEMPHIS & STEPHENSON-BENNETT MINES, undgrnd, Ag, Cu, Pb
Supt: J H Brown
Assay: L B Bentley
Idle

U S POTASH CO
30 Rockefeller Plaza, New York City
Pres & Gen Mgr: H M Albright
VP & Gen Counsel: Paul Speer
VP: Thomas M Cramer
Sec Treas: Walter F Dingley
Asst Sec: Gertrude B Stiehler
Controller: J H Hadfield
MINE & REFINERY, Carlsbad, Potash
Res Mgr: J J Bruhn
Ind Rel Dir: L H Jones
Purch Agt: R D Schenck
Geol: J P Smith
Mine Supt: George Heaton
Mill Supt: R H Mills

U S SMELTING, REFINING & MINING CO (See North Eastern listing)
WESTERN OPERATIONS, Box 1980, Salt Lake City 10, Utah
VP & Gen Mgr: W C Page
Asst to VP & Gen Mgr: B E Grant, O A Glaeser
Mgr, Western Mines: A G Kirkland
BAYARD MINE, Box 698, Bayard, Pb, Zn
Mgr: J T Lewis Jr
Asst Mgr: Elton Clark Jr
450-TON FLOT MILL
Supt: Paris V Brough

VANADIUM CORP OF AMERICA
(See North Eastern listing)
EAST NEW MEXICO MINE, San Juan Co, U

WHITE, DOUGLAS B
Box 601, Silver City
ZUNIGA MINES, W of Fierro, surface, Cu
LEACHING PL
Met: Louis Osmer

WHITE EAGLE MINING CO
Deming
Gen Mgr: J H Harrison
WHITE EAGLE MINE, Fluorspar

ZUNI MILLING CO
(See Shattuck Denn Mining Corp)

OREGON

AFTERTHOUGHT CLAIMS
c/o R A Rockne, Rt 7, Eagleson Rd, Boise, Idaho
MINE, Pb, Ag, dev

AL SARENA MINING CO
Trail
BUZZARD MINE, Au, Pb, Zn, idle

ALCOA MINING CO
Box 199, Hillsboro
BAUXITE DEPOSITS, Columbia & Washington Co, dev
Res Engr: Jack McWilliams

AMIDON, R G & CO, INC
Granite
BUFFALO & TILLICUM MINES, underground, Au, Ag, Cu, Pb, Zn, idle
FLOT MILL
Supt: S J Giulio

ARGONAUT MINE
Baker
ARGONAUT MINE, Au, idle

ARTHUR, JOHN
Baker
CHLORIDE MINE, Rock Creek dist, Baker Co, Au, Ag

ASHLAND MINE
835 N Main St, Ashland
Mgr: Dewey & Fred Van Curler
ASHLAND MINE, 8 mi NW of Ashland, underground, W, Au, idle
CHROME RIDGE MINE, 80 mi from Ashland, Cr
50-TON GRAV MILL, 20-40 tons

BALD MOUNTAIN MINE
Box 11, Sumpter
Owner: D N McTavish
MINE, Sumpter, Au, Ag, Silica
Mgr: W C Fellows
Supt: L L Anderson
Mill Supt: G F Anderson
GEM & BUENA VISTA MINES
Supt: J T Bonner

BARRICK, M F
Rt 2, Jacksonville
HOT BISCUIT, NEW DEAL & GOLD KING CLAIMS, Jackson Co, Au, Ag, idle

BARTELS BROS MINING CO
Cottage Grove
Pres: Wm Bartels Sr
Gen Mgr: Wm Bartels Jr
Supt: F J Bartels
CHAMPION MINE, 14 mi SE of Disston, underground, Au, Ag, Cu, Pb, Zn, Fe
200-TON GRAV FLOT MILL, idle

BIGELOW, GEORGE
Elkhorn Mine, Josephine Co, Au

BIG FOUR MINE, INC
Rt 2, Box 505, Grants Pass
Pres: Newell Wright
Sec Treas: R W Gartlet
GOLD PLACER, hydraulic, idle
Gen Mgr: J E Bartlett

BLUE CHANNEL MINE
Wolf Creek
Operator: Harry Stewart
PLACER, Josephine Co, hydraulic, 1 giant, Au, idle

BONANZA MINES, INC
Box 270, Roseburg
Pres: J W Cook
Gen Mgr: Burt Avery
Purch Agt: J Williams
BONANZA MINE, Sutherlin, underground, Hg, dev
Engr: Herbert N Witt
50-TON FURN, Gould
Foreman: T Bidwell

BOOTH, G B
Sunny Valley
COLUMBIA PLACER, Josephine Co, hydraulic, Au
CLUMBY MINE, Au, Ag

BOWMAN, H L
Box 82, Jacksonville
PLACER tailings, upper Applegate dist

BOWSER, W D
Box 162, Grants Pass
BOWSER #1 & ROBT E MINES, Curry Co, Au
CHROME MINE, 43 mi W of Grants Pass, adit, Cr, 10 tons
GRAV MILL

BRANDENTHALER, A
VIRTUE MINE, Baker, Au, dev

BRATCHER MINING CORP
Rt 1, Box 17, Ashland
Pres: L A Bratcher
VP: RC Van Vleet
BRATCHER MINE #1, 3 mi SW of Ashland, open pit, W, idle
GRAV MILL

BRICE CREEK MINING CO
STONEWALL MINE, Pb, Zn
BIG ROCK MINE, Au
GILBERTON CLAIMS, between Musick & Champion, Au, idle

BRISTOL SILICA CO
Rogue River
Owner: F I Bristol
SILICA QUARTZ PROPERTY, 100 tons
Supt: Rolland Jones

BROWN, AL
Holland
HYDRAULIC PLACER, upper Wolf Cr

BROWN, H L
Wolf Creek
HYDRAULIC PLACER, upper Wolf Cr

BROWN & BENTLEY
Box 185, Wolf Creek
HAZEL QUARTZ MINE, Wolf Cr dist, Josephine Co, Au, Ag, idle

BRYANT, EARL
Box 94, Baker
BAY HORSE MINE, Baker Co, Au, idle

BUCKHORN MINE
Wolf Creek
Owner: Vernon L Story
PLACER, Greenback dist, idle

BUFFALO GOLD DRG CO
Mt Vernon or Box 463, San Francisco, Calif
PLACER, Grant Co, Au, idle

CAL-ORE MINE
Placer on Galice Cr, hydraulic, 1 giant, Au, idle
Mgr: L C Hudson

CALHOUN & HOWELL OREGON
Dale
Mgrs: Howell & Calhoun
ROBBINS, ORIENTAL & NORTH FORK PLACERS, Grant Co, dragline, Au, Ag

CELEBRATION MINE
Canyon City
Owner: Irving Hazeltine
MINE, Cr, idle

CHROME KING MINE
Box 672, Grants Pass
Operators: Thompson & Cox
MINE, near Grants Pass, Cd
Mgr: Edward Cox

CLARK, CLEO C
Leland
GOFF MINE, Josephine Co, hydraulic placer, Au

CLINE, HARRY T
Glendale
TUNNEL SIX BAR, VETERAN & HIAWATHA MINES, 8 mi NW of Glendale, placer, Au, idle

COLLINS, Z J
Box 91, Williams
STEAMBOAT MINE, Jackson Co, idle, Au

COOKE, DON
2914 NE 52nd St, Portland
IDAHO-OREGON MINE, N of Jordan Valley, Perlite, idle

CROWN MINE
Marion Co
MINE, Au, Ag, Cu, Pb, idle

CURL BOURNE MINES
Sumpter
COLUMBIA-LABOR FRACTION, E & E & NORTH POLE MINES, 7 mi N of Sumpter, adit, Au, Ag, idle
Foreman: Hal Bradley
E & E MILL, 100 tons, flot

CURRANT CREEK MINING CO
124 W 2nd St, Prineville
VP: A D Amundson
QUEEN OF OREGON MINE, 7 mi E of Ashwood, Sb, dev
Gen Mgr: Mike Dragich

DANT & RUSSELL, INC
Dantore Div, Box 150, Maupin
Pres: T E Dant
Mgr: E D Zoradi
LADY FRANCES MINE, 13 mi S of Maupin, open pit, Volcanic glass
120-TON GRAV MILL

DAY BASIN MINING CO
Disston, c/o LeRoy Berry
CHAMPION EXT GROUP, 18 mi S of Disston, adit, Pb, Cu, Zn, Au, Ag
THE PROFESSOR GROUP, 22 mi SE of Disston, adit, Cu, Zn, Pb, Ag, Au

DEEN, FRANK E
Bridgeport
BALM TREE GROUP, Malheur Co, placer, Au

DEEP GORGE MINE
Selma, Cr
Owners: J M & M N Gissom

DeJANVIER, GLEN
Gold Hill
MINE, hydraulic, 1 giant, Au, idle

DERRIG, R A
Azalea
DERRIG PLACER, Douglas Co, Au, idle

DIMMICK MINE
615 Dimmick St, Grants Pass
Mine, Au, idle

DUSTIN, EARL
Box 492, John Day
LAST CHANCE MINE, Canyon dist, Grant Co, idle

EAST EAGLE MINING CO
Box 599, Baker
Pres: G R Holderman
Gen Mgr: Raleigh Chadwell
Sec Treas: LaRoy Chadwell
Supt: Robert Chadwell
EAST EAGLE MINE, 42 mi NE of Baker, adit, Au, Cu, Ag, 50 tons
EAST EAGLE MILL, grav flot, 50 tons

EICKEMEYER BROS
Post
MAURY MT QUICKSILVER MINE, 32 mi SE of Prineville, shaft, adit, Hg
MAURY MT RETORT

ESTERLY MINE
Cave Junction, Au, Pt, Cr
Owner: R F Oliphant

EVANS, EE & WE
Box 334, Richland
BADGER QUARTZ MINE, Eagle Creek dist, Baker Au, Ag, idle

FEDERAL PLACER MINE
Rt 2, Box 35, Jacksonville
Operator: O N Snavely
MINE, Little Applegate R, hydraulic, 1 giant, Au

FORREST QUEEN LOGGING & MINING CO, Rt 1, Box 1179, Grants Pass
Pres: R W Sleight
VP: Virginia Niederman
Gen Mgr: E L Niederman
FOREST QUEEN MINE, 7 mi N of Grants Pass, placer, Au
Supt: WMcIntosh
Asst Supt: John Fritz

GATEWOOD, BOB
Rt 2, Jacksonville
Ground sluicing, Au, idle

GILLMORE & DeCHESNE
8008 40th Ave NE, Seattle, Wash
BADGER, HOMESTAKE & GOLDEN GATE GROUPS, Susanville, Au, Ag, Pb, Zn

GOLDEN EAGLE MINE
2017 7th St, Baker
Owner: F R Klein
GOLDEN EAGLE MINE, 16 mi S of Granite, underground, Au, Ag, idle
10-TON STAMP & PLATE MILL

GREAT LAKES CARBON CORP
18 E 48th St, New York, N Y
DICALITE DIVISION, 612 S Flower St, Los Angeles, Calif
Ch Engr: D F Dyramid
PLANT #2, Terrebonne
Supt: A J Carr

GREY EAGLE MINE
Baker
Owner: Anthony Bradenthaler
MINE, Virtue dist near Baker, Sb, Au, W
75-TON FLOT MILL

HAINES, B R
Rt 2, Jacksonville
PLACER MINE, Palmer Cr, 2 giants, hydraulic, Au

HANSEN, FRED
Galice
RAND PLACER, hydraulic, Au

HAYES, BERT
John Day
STANDARD MINE, undergrnd, Cu, Co Au, idle

HEATH & COTTER
Box 434, Grants Pass
JUMP-OFF-JOE GROUP, Josephine Co, hydraulic placer, Au
MILL & CONC

HELENA MINES, INC
327 N 11th St, Corvallis
Pres: Wm E Caldwell
VP & Gen Mgr: K O Watkins
Sec: H E L Barton
HELENA, OREGON-COLO & LEAD CRYSTAL MINES, 14-19 mi SE of Disston, undgrnd, Au, ZnPb, Cu, Ag, idle

HILL, C F
Wolf Creek
PLACER, hydraulic, 1 giant, Au, idle

HI-POTENTIAL MINES
Main & River Sts, Cottage Grove
Owner: Ray E Nelson
UTOPIAN, SWEEPSTAKES & HIAWATHA GROUPS, 36 mi SE of Cottage Grove, underground, Au, Ag, Cu, Pb, Zn, dev

HOMESTAKE MINING CO
Amity
AMITY MINE, Crook Co, underground, Hg, idle
25-TON FURN, Herreshoff

INDEPENDENCE MINE
Kerby
Operator: D A Foster
PLACER, Josephine Cr, Au, idle

JANTZER, JOHN H
Azalea
HYDRAULIC PLACER, Hogum Cr, Au

JAY GOULD CO
2715 6th St, Baker
JAY GOULD MINE, Greenhorn dist, Baker Co, Au, Ag, idle
Supt: Fred Wickham
50-TON MILL

KETCHUM, JIM
Kerby
Ground Sluicing, Au, idle

KLONDYKE MNG & MLG CO
Box 103, New Pine Creek
Pres & Gen Mgr: Ed Benefiel
VP: Jim Benefiel
KLONDYKE MINE, 8 mi E of New Pine Creek, Au, Ag, idle
GRAV MILL

KRIEGER, CLARENCE
Rt 1, Box 7, Jacksonville
KRIEGER PROP, Au, Ag, idle

LA COMBE & DUNCAN
9218 SE Washington St, Portland
SHAMROCK MINE, Baker dist, Au, Ag

LANCE MINE
Box 603, Gold Hill
Owner: R E Cook
PLACER MINE, Foots Cr, hydraulic, Au

LARSON, MERWIN
Rt 2 Jacksonville
LARSON PLACER, sluicing, Au, idle

LAST HOPE MINE
Merlin, Au
Operator: Max Howland

LEWIS PLACER
Galice
Operator: Bud Lewis
PLACER, hydraulic, Au

McCALEB CHROME MINE
Box 26, Selma
Pres: R E McCaleb
MINE, Cr
Foreman: Jack Kelly

McCLUNG, H H
Box 241, Rogue River
PLACER MINE, Gold Hill dist, Au, Ag, idle

McCULLOUGH, LLOYD
Box 142, Durkee
PATSY W & THERESA KAY, placers, Baker Co, hydraulic, Au

McINTOSH PLACER
Wolf Creek
Operator: Harold McIntosh
PLACER, hydraulic, Upper Coyote Cr

McMANUS, R E
Rt 1, Gold Hill
McMANNUS PLACER Hydraulic, 1 giant, Au, idle

McMICHAEL, W M
Azalea
DOUGLAS MINE, Riddle dist, Au, Ag, idle

McTIMMONDS, BERT
706 SE "M" St, Grants Pass
LITTLE ARCTIC PLACER, Josephine Co, Au, idle

MEAD, WM H
208 Fremont St, San Francisco, Calif
VICTORY MINE, Box 197, Glendale
hydraulic placer

MERRICK, EMERSON
1432 E Main St, Medford
GILSON PLACER, 15 mi W of Jacksonvile, Au, Ag, hydraulic
JAY BIRD MINE, 25 mi W of Jacksonville, adit, Sb, idle

MULKEY, CHAS
MULKEY MINE, Greenhorn dist, Baker Co, Au, Ag, idle
(Leased to H A Friedland, Sumpter)

MYERS, R A
4410 Clover Rd, Medford
KATE EL MINE, Jackson Co, idle

NARON & VANDEVENTER
Arvin Calif
LEWIS MINE, near Galice, dragline & wash pl, Au, idle

NORTHWEST COPPER CO
MINE, Marion Co, Cu, Ag, Au, Pb, idle

N W DEVELOPMENT CO
313 Pacific Bldg, Portland 4
PERLITE MINE, idle

O'BRIEN, D S
Prairie City
NEBRASKA BOY MINE #1, Quartzburg dist, Grant Co, Au, Ag, idle

ONSTOTT, RALPH
Star Rt, Box 72, Grass Valley, Calif
GOLD DREDGE, Jackson Co, Au, Ag, idle

OREGON CHROME MINES, INC
Box 475, Grants Pass
MINE, Oak Field, near Selma
(Leased to W S Robertson)

OREGON KING MINES
Ashwood
MINE, Jefferson Co, Au, Ag, Cu, Pb, Zn, Fe, idle
50-TON MILL
(Leased to Henry Adereff)

PACIFIC SMELTING & REFINING CO, Elkhorn
Operator: J D Hewitt
ZINC MINE, under dev

PIERCE, PAUL
Jacksonville
PLACER, hydraulic, Au, Dev

PIEREN, WESLEY & EARL
Galice
LEIPOLD PLACER, Josephine Co, hydraulic, 1 giant, Au

PIERSON, JOHN & GEORGE
Susanville
BEAR CREEK PLACER, underground & placer, Au, Ag, idle

PINE CREEK PLACER CO
Hereford
PLACER MINE, Au, idle

PITTOCK, W H
PITTOCK PLACER, Applegate, sluicing, Au, idle

PORTER BROS DRG CO
Granite, (Clear Cr) Au, idle

PORTER & CO
Box 592, Baker
Gen Mgr: R P Porter
PLACER, Granite, 4, 00-yd bucket dredge, idle
Dredgemaster: Clay LaFon

PORTLAND CONSOLIDATED
2017 7th St, Baker
Owner: Frank R Klein
MINE, 14 mi SW of Granite, undergrnd, Pb, Ag, Zn, Au, idle
(Leased to Chas Sayco & Son)

PYX MINE
Baker
Owner: Jess Edwards & Assoc
PLACER, Greenhorn dist, Au, idle
15-TON STAMP MILL

QUEEN of BRONZE MNG & SMLTNG CO, 622 N 7th St, Grants Pass
Pres, E R Waite
QUEEN of BRONZE MINE, Josephine Co, Cu idle

QUICKSILVER SYNDICATE
Blackbutte
Pres: Frank Taylor
BLACK BUTTE MINE, idle, Hg
Gen Mgr: Fred L Mills
75-TON FURNACE

RAND, LANGDON
Baker
Pres: Irving Rand
JOHNIE & CATHERINE CLAIMS, Sb, Au, W
30 CLAIMS at Homestead, adjoining Iron Dyke Mine, Cu, Ag, Au

RED LEDGE, INC
518 Idaho Bldg, Boise
Pres: W H Simons
Sec: Elmer Fox
MINE near Robinette, Cu, Ag, Au, idle

RICK, W D
Box 223, Baker
MACY MINE, Baker Co, undgrnd, Au, idle
SMALL GIBSON MILL

RIFE, RAY
Glendale
TENNESSEE GULCH PLACER, Glendale, hydraulic, Au

ROBERT E MINE
Box 182, Grants Pass
Owner: W D Bowser
MINE, dev, Au, Ag
10-TON CYANIDE MILL

ROBERTSON, W S, & ASSOC
Box 475, Grants Pass
HUMDINGER MINE, Lower Applegate dist, Au, Ag
BUNKER HILL MINE, Josephine Co, Au, idle

ROSS, WALTER
Granite
LUCKY STRIKE MINE, Grant Co, Greenhorn dist, Au, Ag, idle

SCHLEIGH PLACER
Wolf Creek
Operators: Schleigh & Booth
SCHLEIGH PLACER, Wolf Creek, hydraulic, Au

SEATON, WILLIAM
1331 10th St, Baker
BETTY JANE MINE, Baker Co, Au, Ag

SEMON, R D
Rt 2, Box 29, Medford
SHAMROCK MINE, Ni, W, Co, idle

SMITH LUMBER & MNG CO
Box 701, Wolf Creek
Pres: A C Smith
PLACER MINE, Wolf Creek, Au, idle

SNAVELY, ORVILLE N
Rt 2, Box 35, Jacksonville
OLD FEDERAL MINE, Upper Applegate dist, Jackson Co, Au, Ag

SOUTHERN OREGON MNG CO
1260 Sunset St, Medford
PLACER near Ruch, shovel & asher, Au
Supt J D Browdish

SPANISH GULCH MINES, INC
Antone Rt, Mitchell
MINE, idle (Leased from Waterman Placer)

SPEAKER, HENRY
Wolf Creek
HYDRAULIC PLACER, Wolf Cr, Au

STERLING MINES, INC
Jacksonville
STERLING MINE, placer, 200-yd hydraulic, Au, idle
Gen Mgr: D F McCormick
Operator: P E Pearce

STEWARD, HARRY
Box 115, Wolf Creek
M H DAVIS GROUP, Josephine Co, Au, Ag, idle

STONE, QUENTIN
803 E "D" St, Grants Pass
RENO MINE, Josephine Co, Au, idle

TAKILMA DREDGING CO
Box 15, Takilma
Pres: Howard Beasley
TAKILMA DREDGING MINE, 1 mi N of Takilma, dragline dredge, Au, idle

TAR BABY MINING CO
529 Newhouse Bldg, Salt Lake City, Utah
Pres: W E Caldwell
VP & Mgr: K O Satkins
Sec Treas: M B Slusser
MUSICK MINE, 16 mi SE of Disston, underground, Au, Cu, Ag, Pb, Zn

THOMAS, FRANK
Sunny Valley
THOMAS PLACER, Sunny Valley, hydraulic, 1 giant, Au, idle

THOMPSON & COX
Box 672, Grants Pass
CHROME KING MINE, Cr
Gen Mgr: Edward Cox

TILLER DEVELOPMENT CO
524 Public Service Bldg, Portland
MINE near Tiller, Hg, idle
Mgr: Roy F Hickman
35-TON FURNACE

TRICKEL ELECTRIC SERV
2010 Third St, Baker
BULL RUN, TIMBER CANYON, FRIDAY, SKIPPER MANGANESE & RED ROSE STIBNITE MINES, Baker Co, Au, Mn, Sb, Cu
FRIDAY MILL, Grav, 50 tons
BULL RUN MILL, grav-cyanide, 50 tons

TULARE, GEORGE
Rt 2, Box 371, Gold Hill
SYLVANITE MINE, 3 mi E of Gold Hill, underground, idle
CORPRAL G MINE, 6 mi N of Gold Hill, underground, Au, idle

UDELL & WATKINS
327 N 11th St, Corvallis
YANKEE GIRL MINE & UNION GROUPS, 6 mi N of Blue River, Au

VESUVIUS MINES CO
1011 Bird Ave, San Jose, Calif
Pres. Dr F L Hard
VESUVIUS MINE, 36 mi E of Cottage Grove, Au, Ag, Pb, Zn, Cu, adit
Engr: W W Elmer
(Leased to R E Nelson)
VESUVIUS MILL, 15-ton, amal

WATERMAN PLACER
Mitchell
Pres & Gen Mgr: S C Zinter
VP: A B Estabennet
Purch Agt: W L Eastman
Gen Supt: W A Smith
WATERMAN PLACER MINE, 25 mi E of Mitchell, Au, Ag, Pt, idle
Mech Engr: Glen Findley
Safety Engr: Frank Findley
1,000-yd dragline-hydraulic dredge
(Leased to Spanish Gulch Mines)

WATKINS, KENNETH O
327 N 11th St, Corvallis
WARRNER MINE, Pb, Zn
SUNSET MINE, Au, Cu, Pb, Zn
LEROY MINE, Cu, Pb, Zn
LEHMEN MINE, ANNIE TRAIL GROUP MINES, underground, dev

SOUTH DAKOTA

ABINGDON POTTERIES INC
801 N Main St, Abingdon, Ill
VP: J M Lewis
WHITE ELEPHANT & TOWNSITE MINES near Custer, pegmatite minerals
Mgr: Henry Kautzsch, Custer

AMERICAN COLLOID CO
Merchandise Mart Plaza, Chicago, Ill
BELLE MINE, Belle Fourche, open pit, Bentonite
Supt: Edwin Busfield
BELLE MILL
Prod: 180,000 tons yearly

BALD MOUNTAIN MNG CO
Trojan
Pres: O D Collis
Treas: W H Reidesel
Gen Mgr: C E Dawson
MINE, 6 mi W of Lead, open pit, underground, Au, Ag, 350 tons
Supt: R J Stoehr
Elec Engr: W Hendrickson
Mech Engr: L Tucano
Geol: Paul Miller
350-TON CYANIDE MILL
Supt: R D Gallo
Assay: Wilbur Harris

BELLE ELDRIDGE GOLD MINES
Box 437, Deadwood
Pres: Alfred Haug
Gen Mgr: Carl Johnson
Sec Treas: Ove E Ellefson
BELLE ELDRIDGE GOLD MINES, Au Ag, Pb, Zn, dev
100-ton flot mill

BLACK CRYSTAL MINE
Keystone
Owners: D H & B A Hardesty
MINE, 5 mi NE of Hill City, W, idle

BLACK HILLS KEYSTONE CORP
Keystone
Pres: W K Wallace
INGERSOL MINE, Beryl, Lepidolite, Mica, Tantalite, Feldspar
50-TON FLOT MILL
Mgr: Fremont Clarke

BLACK HILLS TIN CO
332 S Michigan Ave, Chicago, Ill
Pres: R J Beatty Jr
Sec: E A Brophy
Treas: John T Beatty
MINES, Tinton, open pit, Li, Ta, Feldspar, idle
Supt: Jay MacArthur
Mgr: A I Johnson
300-TON GRAV FLOT MILL
FELDSPAR GRINDING PLANT

BLAND, GEORGE
Hill City
BECHER MINE, near Custer, Pegmatite minerals

BOURASSA, CARL
Custer
TIN QUEEN MINE, near Hill City, Pegmatite minerals

BUTTE, CLARKE
Pringle
WHITE CAP MINE, near Keystone, Pegmatite minerals

CANFIELD, C & L
Hill City
EUREKA MINE, near Hill City, Pegmatite minerals

CONS FELDSPAR CORP
Keystone
MINE & MILL, Feldspar
Supt: J W Mitchell
MINE, Custer, Feldspar
80-TON GRINDING MILL
Supt: R H Brigham

CORDES, V & B
Keystone
LONE STAR LODE, near Keystone, Pegmatite minerals

EASTERN CLAY PROD, INC
Box 451, Belle Fourche
Pres: V F Taylor
VP: J N Dunbeck
Gen Mgr: K L Arthur
MINE, 20 mi W of Belle Fourche, open pit, bentonite
500-TON MILL

FISHER, JOHN D
Custer
DIKE LODE MINE, Pegmatite minerals

FRERICKS MINING CO
Deadwood
Pres: A Frericks
Sec Treas: E H Hall
MINE, Au, Ag, idle

GOLD MT MINING CO
Hill City
Pres & Mgr: A J Birdsell
Sec: M E Birdsell
75-TON FLOT MILL, idle

HOEFERT, H L
Custer
ARCADE & VICTORY #3 MINES, Pegmatite minerals

HOLY TERROR MINING CO
Keystone
Sec: George Flavein
Supt: A I Johnson
MINE, Au, idle
100-TON CYANIDE PL

HOMESTAKE MINING CO
100 Bush St, San Francisco, Calif
Pres: D H McLaughlin
VP & Gen Mgr: G N Bjorge, Lead
VP & Treas: A A Bulick
Sec: J W Hamilton
HOMESTAKE MINE, Lead, Au
Asst Gen Mgr: H A Walker
Supt: C N Kravig
Ch Geol: J O Harder
Ch Engr: J D Johnson
Mech Engr: LeRoy Scyhera
Elec Engr: C L Gust
Cons Geol: J A Noble
4,000-TON CYANIDE MILL
Met: Nathaniel Herz

JOHN ROSS MINE
Custer
MINE, 6 mi NW of Custer, Feldspar, Mica, Beryl, Columbite

KEYSTONE FELDSPAR & CHEM
230 W Huron St, Chicago, Ill
PEERLESS MINE, near Keystone, Pegmatite minerals
Mgr: A F Walker

LESSERING & ASSOC
Rochford
BOG IRON & IRON LODE MINES, Limonite, idle
Mgr: John Lessering

LITHIUM CORP OF AMERICA
Rand Tower, Minneapolis, Minn
Pres: K M Leute
WHITE CAP & EDISON MINES, PO Box 62, Rapid City, near Keystone, Pegmatite minerals, Spodumene
Mgr: Fremont Clarke

MAYWOOD CHEMICAL WORKS
Maywood, N J
THE ETTA MINE, Keystone, Spodumene
Mgr: Dewey Peterson

McLAUGHLIN & PHELPS
Custer
TIP TOP MINE, near Custer, Pegmatite minerals

MINERAL MILLS, INC
Custer
OLD MIKE MINE, near Custer, Pegmatite minerals
SCREENING PLANT, near Custer
Mgr: A I Johnson

NATIONAL LEAD CO, BAROID
SALES DIV (See North Eastern listing)
Rep: Reginald Rowland
BENTONITE PITS
Engr: B C Eisley
Pl Supt: D M Middleton

REFINITE CORP, THE
Box 1312, Omaha, Nebr
Pres: W H Ostenberg, Jr
VP: G F Lindig
VP & Gen Mgr: A C Spaulding
Purch Agt: R C Alexander
MINE, Ardmore, open pit, Bentonite
Supt: W F Rainey
Prod: 20 tons

SAGDALENE, BALDWIN
Keystone
PINE CR LODE, near Keystone, Pegmatite minerals

SCHULTZ, LOUIS
Custer
PROSPECT LODE, near Custer, Pegmatite minerals

SCOTT'S ROSE QUARTZ CO
Custer
Mgr: Frank S Scott
RED ROSE MINE, Near Custer, Pegmatite minerals

WATSON & CANFIELD
Keystone
PHYLLIS MINE, near Keystone, Pegmatite minerals
Mgr: Basil Canfield

WESTERN BELL LODE
Rt 2, Box 86, Custer
Owners: Murphy & Nelson
MINE, Au

ZURICH & FLATHERS
Keystone
MINE, near Keystone, Pegmatite minerals

TEXAS

AMERICAN SMELTING & REFINING CO (See North Eastern listing)
SOUTHWESTERN DEPARTMENT
El Paso
Gen Mgr: E McL Tittman
SMELTER, Amarillo, Zn
Mgr: E J Bruderlin
Prod: 56,500 tons yearly
SMELTER, El Paso, Pb, Cu smelting & converting, Zn fuming
Supt: T J Woodside
Prod: 250,000 tons yearly
REFINERY, Corpus Christi, elec Zn
Mgr: C N Waterman
Prod: 30,000 tons yearly

AMERICAN ZINC CO of ILLINOIS
Box 577, Dumas
Pres: H I Young
VP & Gen Mgr: R A Young
MACHOVEC SMELTR, Zn
Bus Mgr: W E H Smith
Purch Agt: W G Hollifield

BADEN HILL FELDSPAR CO
Llano

BENNETT-CLARK CO, INC
Nacogdoches
Pres: G F Clark
MINE, open pit, bleaching clays

BURNEY MINE
Presidio
Owner: E I Burney
MINE, Ag, Pb
(Leased by R I Carr, Shafter)

CARPENTER EXPL CO
Box 657, Van Horn
Mgr: W L deCarbonel
MINES, Van Horn area, Cu, Pb, Ag, Zn

CERTAIN-TEED PROD CORP
(See North Eastern listing)
MINES, Acme, underground, Gypsum

CONS CHEMICAL INDUS, INC
640 Mellie Esperson Bldg, Houston
BAUXITE MINE, Saline Co, Ark

D'ARGON MINING CO
Box 657, Sierra Blanca
MINES, Sierra Blanca dist, Pb, Zn

DRUNZER, M F
Van Horn
MINE, Hudspeth Co, Cu

DRUNZER & STUMBERG
Van Horn
MINE, Hudspeth Co, Cu, Ag

DUVAL SULPHUR & POTASH CO
1120 Esperson Bldg, Houston 2
Pres: F G Zoffman
VP & Treas: Eugene German
Sec: V J Thornhill
Gen Mgr: W P Morris
Purch Agt: J R Smith
ORCHARD MINE, 2 mi SE of Orchard, Sulpher
Gen Supt: J O Tyree
(See New Mexico listing)

ESPERADO MINING CO
Box 1037, Houston
MINE, Brewster Co, Hg

FARNSWORTH, THELMA
Presidio
SILVER DOME MINE, Presidio Co, Ag, Pb

FREEPORT SULPHUR CO
1804 American Bank Bldg, New Orleans 5, La
Pres: L M Williams Jr
VP & Gen Mgr: E D Wingfield
Purch Agt: S L Mayo
SULPHUR MINE, Freeport
Gen Supt: E H McFarland
SULPHUR MINE, Hoskins Mound
Gen Supt: G C McMillen

HAZEL MINE & MILLING CO
c/o A P Williams, Van Horn
MINE, Culbertson Co, Cu, Ag, idle

JEFFERSON LAKE SULPHUR CO
809 Bankers Mortagage Bldg, Houston
OPERATIONS, Brazoria & Fort Bend Co, Sulphur

KATE S BRIGGS QUARRY
Box 15, McNary
QUARRY, Hudseth Co, Gypsum

LONE STAR STEEL CO
4501 W Mockingbird Lane, Box 8087, Dallas
Pres: E B Germany
Exec VP: W H Johnson
VP Oper: W R Bond
VP Sales: W P Moreland
Sec: E S Greer
Dir of Purch: G C Graves
Asst Mgr Oper: T M Hart
Works Engr: E B Hooser
LONE STAR ORE MINE, Lone Star
Div Supt: W L Kendrick
Power Supt: F H Stockton
Mast Mech: J J Day Sr
Const Supt: M H Melton
Elec Engr: J S Scaff
By-Prod Supt: D G Burns
3,000-TON GRAV MILL
Supt: A C Melting
1,200-TON FURNACE
Supt: F G Stark
Asst Supt: S Glenn Anderson

MID-CONTINENT MUD CO
Pandale
BARITE MINE, Val Verde Co

MILWHITE CO
Box 801, Houston
Pres: Max Miller Sr
Exec VP: F A Frank
VP & Gen Mgr: A B Willis
CELESTITE MINE, Brown Co

NATIONAL GYPSUM CO
(See North Eastern listing)
Rotan
QUARRY & PLANT, Rotan, Gypsum
Mgr: J E Irvin
Supt: T W Smith

NATIONAL LEAD CO, BAROID
SALES DIVISION, 2404 Danville St, Houston 6
Gen Mgr: G L Ratcliffe
Asst Gen Mgr: G B Coale & J W Hoffstetter
Prod Mgr: Reginald Rowland
Asst Prod Mgr: Ed Long
HOUSTON PLANT, Houston, bentonite, open pit mine, dry grinding mill
Supt: R J Penrose
TEXARKANA PLANT, Texarkana, oil well chemicals, dry grinding
Supt: J A Smith
(See South Central & Calif listings)

NEYLAND, O L
1450 W Magnolia Ave, San Antonio
GYPSUM QUARRY, Gillespie Co, Texas

PECOS ORLA SULPHUR CO, INC
Orla
Pres & Gen Mgr: P L Meath, 702 Franklin St, Houston
MICHIGAN CLAIMS in Orla, open pit, S C S Lewis, mine & mill supt & res mgr
Prod: 1500 tons

PHELPS DODGE REFINING CORP
40 Wall St, New York 5, New York (subsidiary of Phelps Dodge Corp, Ariz)
OFFICERS of this subsidiary:
Pres: Walter C Bennett
VP's: Cleveland E Dodge, J P Dyer & C S Harloff
Sec & Couns: Julian B Beaty
Compt: J Mills Hawkins
Asst Compt: Raymond Soden
Treas: M W Urquhart
Asst Treas: H R Dobbs
Asst Treas: R D Barnhart
TEXAS OPERATIONS: Box 1372, El Paso
EL PASO REFINERY, El Paso
Electrolytic copper refinery & copper sulphate pl; also produces nickel sulphate, selenium, tellurium, zinc sulphate
Works Mgr: William Knowles
Prod: 240,000 tons annually

SOUTHWESTERN GRAPHITE CO
Burnet
Pres: George W. Clemson
VP: Robert P Miller, Sr
Sec-Treas: G Miller
VP & Gen Mgr: R P Miller, Jr
Supt: G E Hilliard
MINE 11 mi NW of Burnet, Texas, open-pit, graphite
Mine Foreman: Pete Bibles
Ch Engr: D C Peacock
240-TON FLOT MILL
Mill Foreman: T E McAllister

SOUTHWESTERN PORTLAND CEMENT CO
613 El Paso Natl Bank Bldg, El Paso
GYPSUM QUARRY, Hudspeth Co, Texas

SOUTHWESTERN TALC CORP
Llano
Pres: Bertram Browne
VP & Sec: J B Upton
MINE 25 mi SE of Llano, talc open pit
Supt: P C Mayes
prod: 80 tons
MILL, grinding
Supt: Mrs. Viola Offer

TEXAS MINING & SMELTING DIVISION, NATIONAL LEAD CO
Box 559, Laredo
LAREDO SMELTING WORKS, Sb
Mgr: O D Niedermeyer
Asst Compt: T D Bourland
Pl Supt: J E Pimentel
Ch Chem: V M Estes

TIN PROCESSING CORP
Box 1461, Texas City
Ch of Bd: E Warfield
Pres & Gen Mgr: A L Braake
Exec Asst to Pres: H F van der Laan
VP & Asst Gen Mgr: S P Lowe
LONGHORN TIN SMELTER, tin
Purch Agt: A J McSain
Gen Supt: J R Winn
Supt Smelter: W L Follett
Supt Experimental Dept: M K T Reikie
Ch Engr: W Vierling
Ch Chem: H H White
Supt Ore Storage, Roasting & Leaching: J W Boyle
Supt Maintenance: B T Looper
Supt Ore Storage: M L Walker

UNITED STATES GYPSUM CO
300 W Adams St, Chicago 6, Ill
(For officers, see Calif listing)
MINE at New Braunfels, Tex, open-pit, limestone
TWO MINES at Sweetwater, Tex, open pit gypsum

UTAH

ALTA UNITED MINES CO
22 E First South St, Salt Lake City
Pres & Gen Mgr: G H Watson
MINE, Alta, Au, Ag, Cu, Pb, Zn, Fe, W

AMERICAN FORK CONS MINES
405 Dooly Bldg, Salt Lake City 1
Pres: H G Blumenthal
VP: N J Nielsen
Sec Treas: W J Robertson
Gen Supt: Douglas Nielsen
BLUE ROCK MINE, 20 mi NE of Pleasant Grove, undgrnd, Ag, Pb

AMERICAN GILSONITE CO
248 S Main, Salt Lake City
Pres: E F Goodner
Sec & Purch Agt: E H Owne
MINE, Bonanza, gilsonite
Supt: John H Baker
Asst Supt: F Williams
Prod: 250 tons

AMERICAN METAL MNG CO
21 SW Temple St, Salt Lake City
Pres & Gen Mgr: C S Woodward
VP: Ben B Hall
Gen Supt: Frank Yanchar
AMERICAN METAL MINE, 20 mi E of Midvale, underground, Au, Ag, Pb, Cu, Zn
Engr & Geol: R E Marsell

AMERICAN SMELTING & REFINING CO, (See North Eastern listing)
UTAH DEPT, 700 Pacific Nat'l Life Bldg, Salt Lake City
Gen Mgr: R D Bradford
Ore Buyer: C R Fish
Purch Agt: A R Worthen
Mgr Western Oper: J F Johnson
Ch Geol: Manning Cox
Milling Engr: Norman Weiss
Expl Engr: Keith Whiting
GARFIELD COPPER SMELTER, Garfield
Supt: W G Rouillard
Asst Supt: R Thompson

ANACONDA COPPER MNG CO
c/o Rom Warburton, 821 Kearns Bldg, Salt Lake City
APEX DELAWARE GROUP, Nat'l Tunnel Unit, Zn, Pb

ARTESE & JOHNSON
Enterprise
CLAIMS, 9 mi S of Enterprise, open pit, Fe dev

BAR X MINING CO
Box 1053, Salt Lake City
Pres: Feno Tedesco
ESTHER GROUP MINE, Tooele Co, Zn, Pb, Ag

BEAVER CREEK MINING CO
Spanish Fork
MINE, near Park City, Mn, Au, Ag, Pb

BEAVER VIEW MINE
Adamsville
Owner: Morgan Evans
MINE, Beaver Co, 5 mi N of Adamsville, Au, Ag, Pb, Zn, idle
Foreman: Scott Cuttler
(Leased by R W Glenny & Assoc)

BIRCH, L B
Lark
OHIO COPPER MINE, Lark, undergrnd, Au, Ag, Cu, Pb, Zn

BLACKHAWK NO 1
Murray
Operators: C J & A J Collett
MINE, Bluebell dist, Pb

BLUE EAGLE MINING CO
192 S Second St West, Tooele
Mgr: L S Gillett
BLUE EAGLE #1, 2, 3, Tooele Co, Zn, Pb, Ag

BONNEVILLE, LTD
540 W 7th South St, Salt Lake City 4
Pres: W L Bradley
Gen Mgr: L W Ferris
Purch Agt: W R Thomas
MINE, Wendover, Potassium Chloride
1,000-TON FLOT MILL
Mine & Mill Supt: B B Lamus
Asst Mine & Mill Supt: Jesse Ecton
Mill Fore: Hands Wiley
Mine Fore: Nelson Lamus
Met: D C Hunter
Assay: Clyde Andrew

BONNIE LEE MINE
Heber City, Pb
Mgr: Samuel Allison

BULLION MONARCH MNG CO
216 Utah Oil Bldg, Salt Lake City
Sec: R N Cooper
BULLION MONARCH MINE, Marysvale, open pit, U

CACTUS MINE
Milford, Cu
Operators: Hance & Alvey

CANNON PROPERTIES
Stockton, Zn, Pb
Operator: Willis Smith

CARDIFF MNG & MLG CO
704 Newhouse Bldg, Salt Lake City
Pres & Gen Mgr: L EStein
VP: M R Richards
Sec Treas: R A Glenny
CARDIFF MINE, near Alta, underground, Au, Ag, Pb, Zn
Supt: A G Kolovos
(Operated by Cardiff Coalition Co)

CENTRAL STANDARD CONS MINES, 392 E 900 South, Provo
Pres: T F Pierpont
VP: R G Pierpont
Sec: M Gessford
MINE, near Provo, Au, Ag, Pb, dev

CENTRAL SULTANA MNG CO
Mona
Pres: Lucius Rowe
Gen Mgr: Eugene Wilkey
UNDERSIGHT MINE, Ag, Pb, dev

CHEMICAL CORP of AMERICA
Sulphurdale
MINE, open pit, S
200-TON FLOT MILL
Gen Supt: W D Maycock
Cons Engr: C R King

CHESLEY & BLACK
Delta
FLUORINE QUEEN MINE, Delta, open pit, Fluorspar, 180 tons weekly

CHIEF CONS MINING CO
608 Dooley Bldg, Salt Lake City
Pres: Cecil Fitch
VP & Gen Mgr: Cecil Fitch Jr
Sec: W W Watson

CHIEF #1, GEMINI, EUREKA HILL, APEX STANDARD, PLUTUS & EAST CROWN POINT CONS MINES, Box 269, Eureka, shaft, Pb, Zn, Ag, Au, 440 tons
Ch Clk: M Carter
Gen Supt: J G Hall
Lime Pl Fore: R E Steele
Ch Elec: A D Baker
Mast Mech: Sid Tregaskis
Geol: H G Peacock
Engr: H J Pitts
Geochemist: H R Craig Jr
Foreman: L W Brady

COLBATH, ALEX
Leeds
SILVER REEF MINE, Leeds, underground, U

COLORADO CONS MINES CO
1114 Walker Bank Bldg, Salt Lake City
Pres: H E Raddatz
Sec: Glen Hardy
Treas: M D Paine
COLORADO MINE, Dividend, underground, Pb, Au, Ag, Cu

COLORADO FUEL & IRON CORP
(See Colorado listing)
BLOWOUT MINE, Cedar City, open pit, Fe
Res Engr: R L Wahl

COLUMBIA IRON MINING CO
Box 269, Salt Lake City
Pres: Walther Mathesius
VP: L J Westhaver
Purch Agt: G R Ten Eyck
Gen Supt: G D MacDonald
IRON MINE, 20 mi W of Cedar City, open pit
Geol: S G Sargis
Ch Engr: R C Talbott
PLANTS, crushing & screening
Prod: 123 tons monthly

COLUMBUS REXALL CONS MINES CO, Alta
Gen Mgr: A J Selander
HASKELL CLAIM (Leased to Steve Basta)
REXALL MINE, Alta, Ag, Pb, Cu, dev

COMBINED METALS REDCT CO
218 Felt Bldg, Salt Lake City, Box 150
Pres & Gen Mgr: Edward H Snyder
VPs: Otto Herres & W H Kelsey
Treas: O F Burton
Sec: C M Christensen
Purch Agt: E G Black
Ch Engr: M J Kennard
Gen Supt: S E Craig
CALUMET MINE, 6 mi S of Toole, underground, Zn, Pb, Fe, Ag, Au
Geol: E B Young
Met Mgr: Ernest Klepetko
Ch Chem: Harry Hansen
Mill Supt: Winford Hector
1,000-TON FLOT MILL

COMMONWEALTH LEAD MNG
424 Felt Bldg, Salt Lake City
Pres & Gen Mgr: J F Featherstone
VP: R B Garff
COMMODORE MINE, 10 mi SE of Stockton, underground, Pb, Ag, Cu, Zn, dev
Geol: R E Marsell

CONS URANIUM MINES
502 Felt Bldg, Salt Lake City
Pres: E G Frawley
Engr & Geol: Roy A Hardy
110 CLAIMS, Temple Mt, U, 100 tons
(Under contract to Minerals Eng Co)
SINBAD MUDDY RIVER GROUP, U
(Dev with Utah Uranium Corp)
YELLOW CAT GROUP, near Thompson, 68 CLAIMS, Dry Valley dist, U
(Leased from Vanadium Corp of Amer)

CONTINENTAL MNG & MLG CO
Greenriver
MINES near Greenriver, U, V

COPPER MOUNTAIN CO
Atlas Building, Salt Lake City
Sec: A M Buranek
COPPER MT MINE, Cu

CUPRIC MINES CO
39 Exchange Place, Salt Lake City
Pres: P H Hunt
Gen Mgr: J G Sargent
CUPRIC MINE, Milford, Cu
CACTUS MINE, Milford Cu, open pit

DESERT EXPLORATION CO
428 Coatsville Ave, Salt Lake City
Pres: O H Evans
IDA, DESERT VIEW, BLACKJACK MINES & SIMPSON MT MINES, Erickson dist, Au, Ag, Pb, Zn, Mn, Cd
Supt: Jack Morse
50-TON GRAV MILL, to be operated by United Mng Dev Co, Inc.

DIXIE MINE
St George
Operator: E L Cox
MINE, Tutsagubet dist, Washington Co, Cu, Pb

DRAGON CONS MINING CO
Eureka, Ag
Sec: Rom Warburton
MINE, Tintic, 6,000 tons monthly
Gen Supt: J F Dugan

DUTCHMAN COAL MINES CO
1211 S Tremaine, Los Angeles, Calif
Pres: H W Holden
DUTCHMAN GROUP, Zn, Pb

EAST ANTELOPE MINING CO
414 Atlas Bldg, Salt Lake City
Pres: John Matson
Sec Treas: H E Giers

EAST STANDARD MNG CO
Eureka
PROPERTIES near Marysvale, U
EAST STANDARD MINE, near Eureka, underground, Pb, Ag, idle

EMPIRE MINES CO
821 Kearns Bldg, Salt Lake City
Sec Treas: Rom Warburton
EMPIRE GROUP, Juab Co, Au, Ag

ETNA GOLD MINES, INC
208 Beckley Bldg, Las Vegas, Nev
MINE & MILL, 18 mi W of Modena, 175 tons, idle

EUREKA BULLION
Box 1079, Salt Lake City
EUREKA BULLION MINE, Au
(Leased to North Lily Mng Co)

EUREKA LILLY CONS MNG CO
1114 Walker Bank Bldg, Salt Lake City
Pres: H E Raddatz
Sec: Glen Hardy
Gen Mgr & Treas: M D Paine
EUREKA LILLY MINE, Dividend, shaft, Au, Ag, Cu

FAUCETT, V W
Greenriver
CAMP BIRD MINE, undergrnd, U

FLAGSTAFF BONANZA MNG CO
418 Main St, Park City
Pres: Charles Moore
MINE, Au, Ag, Pb, Cu
(Leased from New Park Mng Co)
Foreman: Clifford Workman

FRISCO SILVER-LEAD MNG CO
c/o Tintic Lead Co, 39 Exchange Place, Salt Lake City
MINE, San Francisco dist, Beaver Co, Au, Ag, Cu, Pb

G W B MINING CO
c/o Paul Gorlinski, 1032 First Ave, Salt Lake City
REVELATOR MINE, Ag, Pb
(Leased to Byer Bros, Park City)

GAGON, FRED & GENE
Roosevelt
CLAIMS, Farm Cr, 30 mi N of Roosevelt, Barite, Mn

GARBETT, REUBEN
Box 128, Park City
SILVER CREEK TAILINGS, Uintah dist, Summit Co, Zn, Pb, Cu

GENEVA STEEL CO
(See Columbia Iron Mng Co)

GODIVA MNG & MLG CO
c/o Rom Warburton, 820 Kearns Bldg, Salt Lake City 1
Sec Treas: A H McChrystal
MINE, Eureka, Pb, Zn, Ag

GOLDEN GLEBE CONS MINES
56 Orpheum St, Salt Lake City
VP: JohnV Long
SALT LAKE& MAMIE MINES, Tooele Co, Zn, Ag, idle

GORLINSKI & WHEELER, INC
200 Edison St, Salt Lake City
Mgr: J H Wheeler
SILVER KING WESTERN MINE, Summit Co, Pb

GRAMLICH MINERALS, INC
Moab
Pres & Gen Mgr: J W Gramlich Sr
VP & Supt: J W Gramlich Jr
Sec Treas: P F Gramlich
VANURA MINES, 15 mi W of Greenriver, open pit & adit, U, V
Prod: 10 tons

HAMPTON MINING CO
Box 24, Stockton
Pres: M Chamberlain
SILVER EAGLE MINES, Stockton, Au, Ag, Pb, Zn

HANLEY, J C JR
Box 234, Milford
ST MARY GROUP, Beaver Co, Pb, idle

HENRY & McINTOSH
Marysvale
CLAIMS near Marysvale, U

HONEY COMB MINING CO
Marysvale
Pres: J W McAffee
VP: Don Sheldon
Purch Agt: Onus Beaur
Gen Supt: H P Bertelsen
HONEY COMB MINE, 75 mi NE of Delta, underground, open pit, U
Supt: H P Bertelsen

HORN SILVER MINES CO
39 Exchange Place, Salt Lake City
Pres: P H Hunt
Gen Mgr: J G Sargent
Sec Treas: D H Bullough
HORN SILVER MINE, Milford, Au, Ag, Pb Zn, (Leased to Metal Producers, Inc)
HORN SILVER DUMPS, Zn, Pb, (Operator: Wm Hendrickson)

HOWE SOUND CO
730 Fifth Ave, New York, N Y
REFINERY near Garfield processing cobalt concentrate from Calera Mining Co's flot mill, under const

HOWELL MINING CO
529 Newhouse Bldg, Salt Lake City
Pres: Rich Whitmore
Sec: B B Hall
Gen Mgr: H E Havenor
YANKEE MINE, GLOBE MINE, near American Fork, undgrnd, Zn, Pb, Ag, Cu
YELLOW CANARY CLAIMS near Marysvale, U, dev

INTERNAT'L SMELTING & REFINING CO, 25 Broadway, New York
(Subsidiary of Anaconda Copper Mng Co)
Pres: C F Kelley
VPs: Frederick Laist & E O Sowerwine
Sec Treas: C E Moran
Compt: W K Daly
Agent: Rom Warburton, Utah
UTAH OPERATION, 818 Kearns Bldg, Salt Lake City
Gen Mgr: F A Wardlaw, Jr
Mng Supt: J F Dugan
Met Mgr: B L Sackett
Purch Agt: J H Collins
MILL & SMELTERS near Tooele
Gen Supt: Carlos Bardwell
Mech Engr: R E Long
Safety Engr: T K Voyer
Ch Chem: H T Goodjohn
1,300-TON FLOT MILL, International, Zn conc, 10,000 tons yearly
Supt: R V Kettner
Met: George Kostello
SMELTER & REFINERY, International
Prod: 80,000,000 lbs Pb yearly
3,800,000 lbs Cu yearly
39,275,000 lbs Zn yearly
(as oxide & sulfide)

IBEX GOLD MINING CO
Box 37, Provo
Sec: Leon Newren
IBEX GROUP, Au, Cu

KENNECOTT COPPER CORP
(See North Eastern listing)
UTAH COPPER DIVISION
Box 1650, Salt Lake City 10
Gen Mgr; West Mng Div: Louis Buchman
Gen Mgr; Utah Copper Div: J P Cawfield
Asst Gen Mgr: E W Englemann
Asst to Gen Mgr: Roy Hatch
Dir, Ind Rel: D C Houston
Dir, Lab Rel: J C Landenberger Jr
Dir, Pub Rel: N W Aldrich
Div Compt: G A Soutter
Ch Clk: L J Farrer
Ch Mill Acct: E J Gardner
Ch Mine Acct: A W Watson
Storekeeper, Mills: J W Ridd
Storekeeper, Mines: A J Boberg
Ch Engr: G C Earl
Asst Ch Mgr: L C Jones
Engr, Mines: A Soderberg
Pl Engr: G A Parker
Mast Mech, Mine: G W Bolman
Gen Mast Mech, Mills: A J Fitzgerald
Mast Mech, Mills: L Baldee
Central Power Station, Garfield
Ch Engr: H P Early
Asst Ch Engr: J H Harkins
Mills Ore Haulage, Garfield
Supt: L S Hills
Gen Fore: J W Richardson
Roadmaster: B C Davis
Traffic Mgr: F B Merrill
BINGHAM MINE, Bingham Canyon, open pit, Cu, Mo, Au, Ag
Gen Supt: L F Pett
Asst Supt: V S Barlow
Gen Fore: E C Simkins
Empl Dir: E B McFarlane
Safety Engr: GW Knudsen
Prod: 86,000 tons
MAGNA SELEC FLOT MILL & ARTHUR SELEC FLOT MILL, Garfield
Gen Supt: P H Ensign
Supt, Magna: John Allan
Asst Supt, Magna: T Barker Jr
Supt, Arthur: C G Quigley
Asst Supt, Arthur: F M Barton
Empl Dir: M A Moffat
Ch Elec Engr: R J Corfield
Safety Engr: R L Erickson
Ch Met Engr: A G Johnson
Ch Res Chem: C M Nokes Jr
Ch Anal Chem: V A Frazer

GARFIELD REFINERY, Garfield
Supt: H A Shaw
Asst Supt: K H Koropp
Met Engr: C A Zeldin
Ch Elec: I G Salisbury
Mast Mech: F Johnson
Garfield Water Co & Garfield Improvement Co, Garfield
Supt: H C Anderson
Electrolytic Copper Refinery, under dev

KING DAVID MINING CO
29 Exchange Place, Salt Lake City
Pres: P H Hunt
Gen Mgr: J G Sargent
Sec Treas: D H Bullough
KING DAVID MINE, Milford, Ag, Cu, Pb, Zn, dev

KING of the WEST MINE
915 Continental Bank Bldg, Salt Lake City
Owner: Lawrence Fox
MINE, 30 mi W of Ketchum, Idaho, shaft & Adit, Pb, Zn, Ag, idle

LEE & SMITH
c/o R G Smith, Stockton
FOUR METALS MINE, Tooele Co, Pb, Zn

LEONORA MNG & MLG CO
414 Atlas Bldg, Salt Lake City
Pres: John Matson
VP: J A Child
Sec Treas: H E Giers
MINE, 9 mi W of Milford, Au, Ag, Pb, Zn, Cu, dev

LEVAN MINING CO
Box 111, Provo
Pres: J H Peterson
Gen Mgr: S D Trotter
Sec: Leon Newren
GUY LODE MINE, underground, Mn
Prod: 20 tons

LILE BROS
Box 382, Moab
Pres: H D Lile
Dir: Glenn Lile
POLAR MESA MINES, 55 mi NE of Moab, underground, U, V, 500 tons monthly

LITTLE ALTA MINING CO
Duchesne
Sec: Sylvia Mecham
LITTLE ALTA # 1, 2, 3, 4, dev

LITTLE MAY MINING CO
414 Atlas Bldg, Salt Lake City
Pres & Mgr: John Matson
VP: B B Hall
Sec Treas: H E Biers
LITTLE MAY MINE, Tintic mng dist, Eureka, Au, Ag, Pb, Zn, Cu, S, Fe, Bismuth, dev

LOVELESS & STAHELI
c/o W J Loveless, Payson
VAGABOND MINE, Mount Nebo, Mono dist, Juab Co, Pb

M & M LEAD MNG CO
Fillmore
Sec: Morris Hunter
M & M LEAD MINE, Millard Co, Pb, Zn

MADISON MINES CO
518 Wasatch Oil Bldg, Salt Lake City
Pres & Gen Mgr: Nicholas Morgan Jr
MADISON MINE, Stockton, underground, Au, Ag, Pb, Zn, Cu, dev

MAGNOLIA LEAD & OIL CO
c/o C W Anderson, Manti
Sec Treas: K C Griffith
JOHN HENRY CLAIMS near Marysvale, U
OPEN PIT MINES, Emery Co, U

MAJOR METALS MINING CO
342 Canyon Rd, Logan
Pres & Gen Mgr: H C Hansen
VP: E Stettler
BLUE MOON MINE, 3 mi E of Hyrum, underground, open pit, Zn
Supt: R B Maughan
Asst Supt: W B Douglass Jr
Geol: H C Hansen

MAYFLOWER MNG & DEV CO
Park City
Mgr: William Gay
PARK FLAG MINE, near Park City, underground

McFARLAND & HULLINGER
32 Pinehurst Ave, Tooele
HIDDEN TREASURE MINE, Ophir dist, Zn, Pb, Cu
DALY & ONTARIO DUMPS, Summit Co, Au, Ag, Pb
Supt: K L Erickson, Box 588, Park City

METAL PRODUCERS INC
Milford
Pres: G W Clemson
VP: Otis Burch
Sec Treas: R M Landrum

HORN SILVER MINE, 16 mi W of Milford, underground, Pb, Zn, Ag, Au, 100 tons
Gen Mgr: D C Peacock
Gen Supt: J P Lowe
Foreman: Tony Lerotich
400-TON FLOT MILL, 4 mi W of Milford,
Supt: R V Thompson
Foreman: Geo Bush

METALS COALTION MINE
825 S 10th East St, Salt Lake City
Pres: Leo Peterson
Gen Mgr: E H McCauley
Sec: J M Calderwood
MINE, undgrnd, open pit, Au, Ag, Cu, Pb, Fe, W, Mo, dev
Foreman: E N McCauley

MINERAL VALLEY GOLD MNG
815 First Security Bank Bldg, Salt Lake City
Treas: Russell Cashin
AMASA GROUP, placer, dev

MONO-KEARSARGE CONS MNG
209 Atlas Bldg, Salt Lake City
Pres: Alonzo MacKay
MONO-KEARSARGE GROUP, Tooele Co (Leased to U S Smelting, Refining & Mining Co.)

MONOCCO MINING CO
c/o W C Card, 3081 S State St, Salt Lake City
MONOCCO MINE, Tooele Co, Ag, Pb

MONTEZUMA MINES CO
Monticello
Pres: F A Sitton
MINE, near Monticello, Ra, U, V

MORENO-CRIPPLE CR CORP
405 Interstate Trust Bldg, Denver 2 Colo
Pres & Gen Mgr: R A Bennett
VP: H W Balsley
PROPERTIES, Moab, U, dev

MT MINES CO
21 SW Temple St, Salt Lake City
Pres & Gen Mgr: C S Woodward
Sec: R W Edmunds
MINE near Alta, Au, Ag, Pb, Zn, Cu, Fe
Engr: G A Finlayson
Geol: R E Marsell

MT VIEW MINING CO
821 Kearns Bldg, Salt Lake City
Sec: Rom Warburton
MT VIEW GROUP, Utah Co, Ag, Au, Pb, Zn

NASH & ADAMSON
Box 77, R F D American Fork
FLORAL LODE, Utah Co, Zn, Pb, Ag

NEW MAJESTIC MINING CO
Atlas Bldg, Salt Lake City
Pres: E C Barton
HARRINGTON MINE, near Milford, Pb (Leased to Harrington Mines Co)

NEW PARK MINING CO
Keetley
Pres & Gen Mgr: W H H Cranmer
VP: R C Wilson
Sec: Fraser Buck
Asst Sec: R L Cranmer
Purch Agt: C D Harper
MINES, open pit & undgrnd, Au, Ag, Cu, Pb, Zn, U, 250 tons
Supt: Clark L Wilson
Foreman: W A Mair
Ch Geol: R E Gilbert
Asst Geol: Peter Joralemon
Mine Geol: W E Bauer
Engr: R A Kuhlman
Assay: H P Walch

NEW QUINCY MINING CO
Felt Bldg, Salt Lake City
Sec: Mr Crandall
J I C MINE & W QUINCY MINE, Snake dist, Wasatch Co, Zn, Pb, Ag

NORTH LILY MINING CO
820 Kearns Bldg, Salt Lake City
Sec Treas: Rom Warburton
NORTH LILY MINE, Utah Co, Pb, Zn, dev
TINTIC BULLION MINE, Utah Co, Zn Pb, Au, Ag, idle

NORTH STANDARD MNG CO
257 N 4th West, Provo
UNITED METALS MINES, Box Elder Co, Pb, idle

OPHIR DEVELOPMENT CO
Ophir
Pres & Mgr: D C Gilbert
MINE, Ophir, Cu, Pb, Zn, Ag (Leased to U S Smelting, Refining & Mining Co)

ORO DEL REY
2035 S 17th East, Salt Lake City
Pres: Alma Tripp
ORO DEL REY MINE, 7 mi W of Callao, Tooele Co, underground, idle
Engr: A B Tripp

PARK CITY CONS MINES CO
625 Eccles Bldg, Ogden
Pres: C V Stehle
VP & Sec: J A Howell
Gen Mgr: John Kasteler
PARK CITY CONS MINE, Park City, underground, Ag, Pb, Zn, idle

PARK FLAG MINES CO
608 Walker Bank Bldg, Salt Lake City
Pres: Dewitt Van Evera
Sec Treas: L G Kelly
MINE, Park City, Au, Ag, Pb, Zn

PARK UTAH CONS MINES CO
1003 Continental Bank Bldg, Salt Lake City
Pres: Lawrence Fox
Gen Mgr: P H Hunt
Sec Treas: J W Stoner
Gen Supts: G S Krueger & H C Wallace
PARK CITY, DALY & ONTARIO MNS, 3 mi SE & SW of Park City, underground, Pb, Ag, Zn, 4-5,000 tons monthly
Geol: E A Hewitt
Engr: Harry Dappler
Mech Engr: P O Reynolds
Elec Engr: David Thompson
Safety Engr: C W McCullough

PENN UTAH MINING CO
Milford
Gen Mgr: A M Bealer
O K MINE, Milford, Au, Ag, Cu

PLUMBIC MINES CO
39 Exchange Bldg, Salt Lake City
Pres: P H Hunt
Sec: D H Bullough
Mgr: J G Sargent
JEEPSTER MINE, Marysvale, Undgrnd, U
PROPERTIES, Beaver Co, Pb, Zn

PROSPER DEV & HOLDING CO
Milford
Pres & Gen Mgr: A M Bealer
VP: John VanDyke
Gen Supt: L B Chulski
OLD HICKORY HARDROCK MINE, open pit, Au, Ag, Cu, W, Fe
Supt: Gotfrid Peterson
Engr: Karl Hutchins
100-TON FLOT MILL dev
Assay: Dearson & Nichols

PRIVATEER MINING CO
Box 111, Provo
Sec: Leon Newren
LITTLE EVA & STARR GROUPS, Zn, Pb

RAVEN MNG CO of UTAH
Roosevelt
Pres & Gen Mgr: F C Ferron
VP & Gen Supt: R A Ferron
PARIETTE MINE, 12 mi S of Myton, underground, Gilsonite
Foreman: Ralph McMullin
E B MINE, 45 mi SE of Vernal, underground, Gilsonite
Foreman: Richard O'Neil

RAY MNG & DEV CO
43 W 4th South, Salt Lake City
THIRD TERM MINE, Tooele Co, Pb

ROBINSON, JOSH
Fillmore
GALENA MINE, Millard Co, Pb, dev

ROYSTON COALITION MINES
Marysvale
Sec Treas: R A Glenny
LUCKY STRIKE & KENNEDY GROUPS, Marysvale, U, dev

SALINA LEAD & ZINC CO
Richfield
SLAT GAP GROUP, Zn

SCHEELITE QUEEN MINE
Spanish Fork, W
Mgr: Duke Page

SHEEP TRAIL MINE
Ibapah, Ag, Pb
Mgr: S H Nicholas

SILVER HORN MINING CO
1024 1st Ave, Salt Lake City 3
Pres: E A Hunt
Gen Mgr: L B Glafcke
MINE, underground, open pit, Au, Ag, Cu, Pb, idle

SILVER KING COALITION MINES
1010 Kearns Bldg, Salt Lake City
Pres: T F Kearns
VP & Gen Mgr: James Ivers
Mgr of Oper: M G Heitzman
Purch Agt: J F Flanagan
SILVER KING MINE, Park City, underground, Au, Ag, Cu, Pb, Zn
Supt: Theo Smith
Engr: J H Winwood Jr
Mech Engr: F M Stone
800-TON FLOT MILL
Supt: William Shea
Assay: Thomas Grose
Prod: 2,900 to 4,000 tons monthly

SILVER LEAF MINING CO
1919 Yale Ave, Salt Lake City
Pres: M A Bourne
SILVER LEAF MINE, American Fork dist, Utah Co, Zn, Pb, Ag

SILVER PRINCE MINE
Caliente
Operator: Jesse Windsor
MINE, Callao, Tooele Co, Ag, Pb

SILVER STANDARD MNG CO
606 Nat'l Savings & Trust Bldg, Salt Lake City
Pres: L N Ellsworth
SILVER STANDARD MINE, Lakes of Killarney Group, undgrnd, Au, Ag, Pb, Co

SILVER STAR MINING CO
Adamsville
Mgr: M Evans
BEAVER VIEW MINE, Au, Ag, Pb, Zn, W
Supt: Bob Glenny
Asst Supt: W H Evans
Foreman: Scot Cuttler

SMITH, WILLIS
Stockton
CLAIMS, Dugway dist, Tooele Co, Zn, Pb

SNOW, KENNETH
Jensen
CLAIMS, 7 mi E of Jensen, U, dev

SOUTH FORK MINING CO
2705 S 20th East, Salt Lake City
Sec: W Malmborg
CRESCENT SILVER, SNOWDRIFT & STORM KING GROUP, Pb, Ag, dev

SPIDER URANIUM MNG CO
Callao
Partners: McAffee, Bertelson, Thomas, & Baur
CLAIMS near Callao, U, dev

SPOR, G P, & SONS
Delta
FLUORIDE MINE, Delta, underground, open pit, Fluorspar, dev

STANSBURY CONS MINING CO
Box 804, Grantsville
Pres: E C Berry
VP & Supt: C D Bennett
Sec: R C Gehrig
MINE, Ag, Cu, Pb, Zn, Fe, idle

STAR DUST MINES, INC
Gold Hill
Pres & Gen Mgr: Fred Cook
Sec Treas: R D Pomeroy
MINE, undergrnd, open pit, W, dev

TINTIC LEAD CO
39 Exchange Place, Salt Lake City
Pres: P H Hunt
VP & Mgr: J G Sargent
Sec Treas: D H Bullough
MINE, Milford, Au, Ag, Pb (Leased)

TINTIC OUTPOST MNG CO
825 S 10th East, Salt Lake City
Pres & Gen Mgr: J M Calderwood
VP: Sam Hamilton
TINTIC OUTPOST, Au, Ag, Pb, Zn, Fe

TINTIC STANDARD MNG CO
1114 Walker Bank Bldg, Salt Lake City
Pres: H E Raddatz
Gen Mgr: M D Paine
Sec: Glen Hardy
TINTIC STANDARD, IRON BLOSSOM & COUGAR MINES, Dividend, Au, Ag, Cu Pb, shafts, idle

TREASURE HILL MINES CO
510 Felt Bldg, Salt Lake City
Pres: O W Moyle
MONO GROUP, Au, Ag, Cu, Pb, dev
Mgr: G D Wakefield
Supt: F D Sayler

UNITED MINERALS RESERVE
518 Felt Bldg, Salt Lake City
Pres & Gen Mgr: G W Snyder Jr
VP & Sec Treas: G W Snyder
Purch Agt: M Diehl
Geol: M W Rankin
Ch Engr: H A Covey
(See Idaho & Nev listings)

UNITED STATES GYPSUM CO
(See North Eastern listing)
GYPSUM MINE, Nephi, underground
GYPSUM MINE, Sigurd, open pit

U S SMELTING, REFINING & MINING CO, (See North Eastern listing)
WESTERN OPERATIONS, Newhouse Bldg, Box 1680, Salt Lake City 10
VP & Mgr, West Oper: W C Page
Asst to VP & Mgr: O A Glaeser, B E Grant
Mgr, West Mines: A G Kirkland
Asst Mgr, West Mines: J M Ehrhern
Mgr, U S Stores: C A Johnson

UTAH OPERATIONS, U S & Lark Mine, Bingham dist, Pb, Zn, Cu
Gen Supt: M M DuBois
Supt, U S: J W Holmes
Supt, Lark: Benton Boyd
MIDVALE FLOT MILL & SMELTER
Mgr: Hugo L Johnson
Mill Supt: R A Pallanch
Smelter Supt: C A Nelson

UTAH ALLOY ORES, INC
Thompson
Gen Mgr: R E Nye
MINE, V
Foreman: Chas Cate

UTAH CENTRAL MINES CO
588 E 13th South, Salt Lake City
Gen Mgr: F J Sylvester
Sec Treas: F G Higenbotham
MINE near Lucern, Ag, Pb, dev

UTAH GALENA OIL CORP
184 E 5th North, Provo
Pres & Gen Mgr: B H Bullock
VP & Gen Mgr: B V Bullock
Sec Treas: J W Boswell
MINE, 6 mi N of Eureka, underground
Geol: G H Hansen, Kenneth Bullock

UTAH MINE GROUP
1358 Glenmare St, Salt Lake City
Owner: E G Woolley Jr
MINE near Fish Springs, Au, Ag, Pb, dev

UTAH QUEEN & MOYLAN MINES
1008 Kearns Bldg, Salt Lake City
Owners: Bradley & Graham
Mgr: G J Gibson
MINE, Ophir mng dist, dev

VANADIUM CLAIMS
Blanding
Owners: Shumway & Seth
MINE, V, U, dev

VANADIUM CORP of AMERICA
(See North Eastern listing)
PROSPECTOR & FREEDOM # 1, 2 MINES, near Marysvale, underground, U, dev
Supt: W Withmeyer
MINES, White Canyon near Hite
Supt: J A Maxwell
50-TON PILOT PL, White Canyon, Cu, U
Supt: Leroy Parker

VICTOR CONS MINING CO
820 Kearns Bldg, Salt Lake City
Sec Treas: Rom Warburton
VICTOR GROUP, Juab Co, Au, Ag, idle

WAH-WAH MINING CO
404 Dooly Bldg, Salt Lake City
Pres: J H Dugdale
VP: E G Richards
Sec Treas: E A Laughlin
MINE, Beaver, Pb, Zn, idle

WARD LEASING CO
1956 Princeton, Salt Lake City
Pres & Gen Mgr: L N Rasmussen
BLACK BOY MINE, Joy, Mn, Fluorspar
Supt: L J Price
Engrs: Frank Walthall, H R Fisher

WASATCH MINES CO
21 Stock Exch Bldg, Salt Lake City
Sec & Gen Mgr: A J Selander
FLAGSTAFF & WASATCH MINE, Alta, Au, Ag, Cu, Pb

WEST PARK MINING CO
Rm 9, 8 Center St, Provo
Pres: J H Petersen
Gen Mgr: A H Scott
Purch Agt: Leon Newren
PROPERTY, Wasatch Co, underground, Au, Cu, dev

WESTERN GYPSUM CO
Salt Lake City
Pres: S H Eliason
Gen Mgr: R D Hess
Purch Agt: E L Hildebrand
MINE, Sigurd, open pit, gypsum, 400 tons

WORTLEY, G W
Bountiful
ATKINSON TAILINGS, Summit Co, Pb, Ag

YANKEE CONS MINING CO
821 Kearns Bldg, Salt Lake City
Sec Treas: Rom Warburton
YANKEE MINE, Utah Co, Au, Ag, Cu, Pb, Zn

ZENDA GOLD MINING CO
(See Nev & Alaska listings)
WASATCH CLAIMS, near Salt Lake City, Zn, Pb, Ag

WASHINGTON

AAVESTRUD & WELLER
Box 385, Coulee City
KELLY CAMP MINE, Ferry Co, W, dev

ADMIRAL CONS MINING CO
409 American Legion Bldg, Spokane
Pres: O L Hood
VP: Elsa P Brunelle
Sec Treas: Mrs J Brown
Gen Mgr: E R Woodward
ADMIRAL CONS MINE, 1 mi N of Lead Point, Ag, Pb, Zn
75-TON FLOT MILL
Supt: K A Akers

ALDER GOLD-COPPER CO
403 Realty Bldg, Spokane
Pres: E Royce
VP: J L Magney
Sec: R K Magney
ALDER MINE, Twisp, underground, Au, Ag, Cu, Zn, 300 tons
Mgr: Harvey F Stone
300-TON FLOT MILL
Met: F A Sharp

AMERICAN CHROME & MAGNESIUM INDUSTRIES, INC
1101 Terminal Bldg, Seattle
Pres: A H Wild
CHROME PLANT, Anacortes

AMERICAN GRAPHITE METALS
Box 123, Yakima
Pres: A E Patnode
VP: L W Donaldson
Gen Mgr & Purch Agt: E R Thoma
Supt: F B Satterlee
MINE, Omak, Flake graphite, Pb, Zn, Ag, Au, Sb
100-TON GRAV FLOT MILL, dev

AMERICAN SMELTING & REFINING CO, (See North Eastern listing)
TACOMA SMELTER, Tacoma, copper smelter, converter, refinery & arsenic refinery plant
Gen Mgr: E R Marble
Asst Mgr: G E Sigler
Gen Supt: P T Benson
Purch Agt: J F Vogel
VANSTONE MINE, Stevens Co
1000-TON MILL, under const

AMERICAN ZINC, LEAD & SMELTING CO, 927 Old Nat'l Bank Bldg, Spokane 8
Pres: H I Young
Western Mgr: D I Hayes
GRANDVIEW MINE, Metaline Falls, underground, Pb, Zn, Ag
Purch Agt: Ben L Coomes
Gen Supt: H F Mills
Mine Supt: J W Currie
Foreman: C L Sage
Engr: M W Scott
Mast Mech: Roy Gilbert
750-TON FLOT MILL
Supt: H P March
Met: D P Underwood

ANACONDA COPPER MINING CO
(See North Eastern listing)
Box 69, Colville
Purch Agt: R D Delaney
BONANZA MINE, 16 mi N of Colville, Pb, Ag, adit, sq-set, cut-fill stopes
Supt: W L Seymour
Foreman: J S Lyons
OLD DOMINION MINE, Ag, Pb, Zn
70-TON FLOT MILL, Palmers Siding
Supt: Harvey Glover

ARK & HI-CLIFF MINES
15810 Van Aken Blvd, Cleveland, O
c/o J Davidge Warfield
MINES, Stevens Co, Ag, Pb, Zn, Cu, idle
30-TON MILL

BALTIMORE MINES, INC
151 Nickerson St, Seattle
Chairman: Ralph A Younkin
Pres: Lester Tibbets
VP: Lester A Lough
Sec-Treas: J E Runck
Gen Mgr & Purch Agt: E R Carlisle
BALTIMORE MINE near Mazama, underground, Au, Ag
Engr: George R Johnson
Idle

BEAR BASIN MINING CO, INC
641 N Callow Ave, Bremerton, Wash
Pres & Gen Mgr: Edwin R Saurers
Secy, Mast Mech & Purch Agt: Carl L Johnston
Treas: Harry L Winkley
BEAR BASIN MINE, Box 23, North Bend, Au, Ag, Cu, Pb, Zn, Mn, Mo
Engr: Olin M Sprague
Mine Foreman: Edward Hall
FLOT MILL
Mill Foreman: Bob Crippin
Idle

BIG DOME MINING CO
Kittitas Co
Pres: Oscar Johnson, 104 12th Ave N, Seattle
Sec-Treas: Wm Petroborg, 822 W 70th St, Seattle
Cu, W
Idle

BLACK WARRIOR MINING CO
1329 Old National Bank Bldg, Spokane
Pres: Frank Funkhouser
Sec-Treas: Robert A Gane, Jr
Dir & Mine Mgr: Howard Harris, Stehekin
BLACK WARRIOR MINE, Pb, Zn, Cu, Ag, Chelan Co
Idle

BLISS, WALTER S
Orient
KETTLE RIVER PROPERTY Stevens Co, Pb, Zn, Cu
Idle

BLUE BELL GOLD MINING CO
1525 Pacific Ave, Tacoma
(Mutual Industries, Ltd, lessees)
Gen Mgr: A H Draughon
MINE in Summit dist, Pierce Co, Au, Ag, Cu, Zn

BONANZA LEAD CO
Box 111, Colville
Owners: E B Gibbs, I M Hunley
OLD DOMINION & BONANZA MINES
70-ton flot mill
Operated by Anaconda Copper Mining Co
YOUNG AMERICA MINE (See Young America Mines, Inc)

CALTON MINING CO
Pres: Ray C Avons, Rt 1, Leavenworth
POLE PICK MINE, Chelan Co, Au, Ag, Pb, Cu
(Leased from Gold Bond Mining Co)
Under dev
40-TON GRAV MILL

CARDINAL, FELIX J
508 Norfolk Bldg, Spokane
LEAD TRUST PROPERTY, Stevens Co, Pb
(Leased from Ray Cater, Marlin)
Under dev

CASCADE MINING CO, INC
Skykomish
Pres & Gen Mgr: Henry E Trenk
VP: Richard C Rochester
Sec-Treas: Arthur Becker
ACES-UP MINE, connecting with Cleopatra mine, 8 mi SW of Skykomish, underground, Ag, Pb, Sb

CHEWALAH EAGLE MINING CO
Chewelah
Pres: Dr S P McPherson
UNITED COPPER MINE in Stevens Co, Cu
Idle

CHINOOK MINING CO
c/o H C Lawson, R R 1, Prosser
Partner: O Smalley
Partner: H C Lawson
TIP-TOP MINE, underground, Au, Ag, Cu
Idle

COLE, ROBERT J
1933 Blenheim Drive, Seattle 2
LONE JACK MINE, 20 mi NE of Glacier, underground, Au, Ag
Idle

COLUMBIA LEAD & ZINC MINING CO
502 Hyde Bldg, Spokane
Pres: R P Wallis
VP: Harry Homad
Sec-Treas: H S Johnston
MINE, 8 mi N of Metalline Falls, Zn, Pb
Under dev

COLUMBIA TUNGSTEN CORP
Cedonia
MINE near Cedonia, underground, W
under dev

COMSTOCK MINE
Orient, Clugston Creek Dist, Stevens Co
Supt: Les Gourlay
Cu, Pb, Zn
Idle

CONSOLIDATED MINES & SMELTING CO, LTD
Box 66, Kenmore
Pres & Gen Mgr: O B Brown
Sec-Treas: D N Gellatly
FIVE PROPERTIES at Keller, Ferry Co, underground & open pit, Cu, Pb, Zn, Ag, Au
Under dev

CONSOLIDATED SPECULATOR CORP
c/o Mr & Mrs S W & Joseph Zoldok, 12 E 27thAve, Spokane
Pres: Joseph M Zoldok
VP & Gen Mgr: Stephen W Zoldok
LUCILLE MINE, 2 mi N of Leadpoint, underground, Zn, Pb, Ag, Cu
Idle

DAVIDSON, ROY & LEE WOODS
Box 148, Colville
GALENA KNOB PROPERTY, Stevens Co, Pb, Ag,
Idle

DEAN, JAMES P
Rt 4, Box 276, Olympia
FRISCO STANDARD MINE, Stevens Co, Ag, Cu, Pb
Idle

DEER TRAIL MINES
Fruitland
Lessee: MacSlate, Albany, Oregon
UNDERGROUND MINE, Ag, Pb
FLOT MILL
Under dev

FLAG HILL MINES CORP
Rt 10, Box 760, Olympia
Pres: Henry Skinner, Rt 10, Box 510, Olympia
VP: Glenn Ross, Moses Lake
Sec-Treas: W R McDougall
Dir: H C Skinner
Dir: A H Blocher
MINE, Republic, underground, Au, Ag, Idle
Foreman: G H Thayer, Box 511, Republic
SCALAWAG & C O D CLAIMS, Au, Ag, Under dev.

GERMANIA CONSOLIDATED MINES, INC
416 Empire StateBldg, Spokane 8
Pres: Julius A Franz
VP: Henry Franz
Sec-Treas: E I Fisher
Gen Mgr: H G Loop
GERMANIA CONSOLIDATED MINE, 15 Mi fromHunters W, veins dev by adit with sq-set & open stopes
Supt: William Traver
Prod: 40 tons
GERMANIA CON MILL, 40-ton, grav-flot

GLADSTONE MOUNTAIN MINING CO
202 Radio Central Bldg, Spokane
Lessee: W L Clearwaters, Millwood
Pres: J S Ramage
VP & Mgr: W J Nicholls
Sec-Treas: K M Nicholls
GLADSTONE MINE at Leadpoint, Pb, Ag

GOLD BOND MINING
514 Columbia Bldg, Spokane 8
Pres & Gen Mgr: Frank Lilly
VP: H D Hackney
Sec-Treas: F W Kiesling
Dir: F L Engard, Jr
Dir: H G Bonner
POLE PICK & OLYMPIA MINES, Ag, Au, Cu
500-TON FLOT MILL
Under Dev

GOLDFIELD CONSOLIDATED MINES CO
Box 2520 or 206 N Virginia St, Reno, Nevada
Pres: George Wingfield
Sec: Geo M Spradling
VP & Gen Mgr: E A Julian, 1 Montgomery St, San Francisco, Calif
VP & Dir: T L Wilcox
VP & Dir: Wm Woodburn
VP: W A Swan
Dir: M Rice
ANDERSON MINE, Stevens Co, open-pit, Pb, Zn
DEER CREEK MINE, Zn, Pb, Ag, Cu
Res Mgr: T Higginbotham, Colville
SIERRA ZINC MINE, Zn, Pb
225-TON FLOT MILL

GOURLIE, W & SPAFFORD, E H
Box 155, Twisp
GOLDEN ARROW MINE, Slate Creek dist, Whatcom Co, Au, Ag

GRANDVIEW MINES, INC
310-311 Radio Central Bldg, Spokane
Pres: Karl W Jasper
VP: Paul L Hoetzel
Sec Treas: E K Barnes
GRANDVIEW MINE, 3 mi NE of Metaline Falls, underground, Zn, Pb
(Leased to American Zinc, Lead & Smelting Co)
FLOT MILL

GREY EAGLE MINE
Box 411, Chesaw
Operators: Phillips & Hagwell
MINE, Myers Cr & Mary Ann Cr dist, Okanogan Co, Au, Ag

H & H MINES, INC
S 18 Stone St, Spokane
Pres: L J Burrows
VP: J L McLaughlin
Sec Treas: R S McClintock
Gen Mgr: W J Noon
DREDGE PLACER, Drummond, Mont
DREDGE PLACER, Elk City Nev

HIDDEN TREASURE MINE
c/o Norman D Lindsley, Box 452, Chelan
MINE, Au, Ag, Cu, Pb, idle

HIGHLAND MNG & MLG CO
1008 S Sprague St, Tacoma
Pres & Mgr: M Slabodnik
Sec Treas: V O Barkley
MINE, Squaw Cr mng dist, Au, Zn, idle

HORSESHOE BASIN MNG & DEV
245 4th St Bldg, Bremerton
Pres & Gen Mgr: M A Morrison
MINE, Chelan Co at Stehekin, underground, Au, Ag, Cu, Pb, Zn, W, idle
Foreman: Ray Sherwood
Engr: Dale Joliffe
50-TON FLOT MILL

HOUGLAND, EVERETT & I G
Republic
VALLEY MINE, 10 mi N of Republic, Au, Ag, shaft, idle

HOWE SOUND CO
Chelan Division, Holden
Pres: H H Sharp
Treas: E Richter
HOLDEN MINE, Cu, Au, Zn, Ag
Mgr: J J Curzon
Purch Agt: E D Haddon
Supt: John Bley
Foreman: C L Hicks
Engr: W S Phillips
Mech Engr: A M Sunde
Elec: B Miller
2,000-TON FLOT MILL
Supt: J S Mitchell
Met: M DeFoe
Assay: W Tooke

IMPERIAL MINE
Mazama
Operators: Mahlon McCain & Stewart
MINE, Okanogan Co, Au, Ag, Cu, idle

INDEX MINING CO
2410 Monte Vista Pl, Seattle 99
Mgr: C V Brennan Jr
SUNSET COPPER MINE, Snohomish Co, underground, Au, Ag, Cu, dev
150-TON FLOT MILL

JIM CREEK MINES, INC
Ione
JIM CREEK MINE, 6 mi NW of Ione, underground, Pb, Ag, Zn, idle
40-TON MILL, under dev

JOHNSBURG MNG & MLG CO
Mount Vernon
Pres: C O Davis
MINE, Skagit Co, Ag, Pb, idle

JOHNSON, CLYNE J
Wawaiwai
WAWAIWAI PLACER, Snake R dist, Garfield Co, Au, Ag
(Leased to S H Bowers, Moscow, Ida)

JORDAN, C B
Rt 2, Cle Elum
ACE OF DIAMONDS MINE, Kittitas Co

KAABA SILVER LEAD MINES
612 Arcade Bldg, Seattle
Pres: A W Webster
KAABA MINE, Nighthawk, underground, Ag, Cu, Pb, Zn
Gen Mgr: L B Carroll
Supt: Arthur Peterson
300-TON SINK FLOT MILL
Prod: 275 tons

KEEGAN MINING CO
1st & Mission Sts, Wenatchee
Owner: J J Keegan
GOLD KING MINE, Au, Ag
(Leased to Lovitt Mng Co, Inc)
CYANIDE FLOT MILL
MINES at Entiat, Riverside, Wenatchee, Dolomite, Silica sands
(Owned by Keegan Bros)
Foreman: Wm Savage

KETTLE RIVER CONS MINES
Box 12, Cowiche
Pres: H S Radenmacher
VP: A D Strand
Sec Treas: A N Christensen
F H & C MINES, SWAMP KING, PRINCE ALBERT & MONT-WASH MINES, 7 mi NE of Orient

KEOKUK ELECTRO-METALS CO
Box 361, Wenatchee
Pres: G L Seissenburger
VP: L E Othmer
BUCKHORN IRON MINE, Okanogan Co

KNOB HILL MINES, INC
206 Sansome St, San Francisco, Calif
Pres & Gen Mgr: H N Kuechler Jr
VP: C L Cooper
Sec: D D Farley
Treas: L E Hellar
Gen Supt: A R Patterson
KNOB HILL & MT LION MINES, Republic underground, Au, Ag
Supt: J E Davis
Foreman: H W Marsh
Engr: T L Pittman
400-TON FLOT MILL, cyanidation of tailings
Supt: Louis Lembeck
Assay: A J Fergus

KROMONA MINES CORP
721 Lloyd Bldg, Seattle
Pres & Gen Mgr: J F Krom
VP: J F Brand
Sec Treas: George Wizer
KROMONA MINE, 19 mi NE of Sultan, Snohomish Co, Au, Ag, Cu, Mo, dev
100-TON FLOT MILL

LAKE SERENE MNG CO, INC
Snoqualmie
Pres: Frank Waugaman
VP: Hector Brown
Sec Treas: Mrs Hazel Waugaman
WILBUR-INDEX MINE, 3 mi S of Index, underground, Ag, Cu, idle

LASOTA, F P
Metaline Falls
BROMIDE MINE, Pend Oreille Co, Ag, idle

LAST CHANCE CONS MINES
405 Realty Bldg, Spokane
Pres: W E Cullen Sr
Gen Mgr: J L Magney
Sec & Purch Agt: R K Magney
Treas: K H Blaesser
LAST CHANCE, GREAT WESTERN & BLACK ROCK MINES, Northport, Pb, Ag, Zn, idle
Asst Supt: Arthur Magney
60-TON FLOT GRAV MILL

LAUCKS CHEMICAL CO
1008 Western Ave, Seattle
Pres: J T Laucks
VP: F P Owens
Sec: G O Freeman
Purch Agt: B White
TONASKET DIVISION MINE, 6 mi NW of Tonasket, open pit, Gypsum, 150 tons
Gen Mgr: R W Cool

LEAD POINT ELEC MNG CO
1373 W Compton Blvd, Compton, Calif
ELEC POINT MINE, Stevens Co, Ag, Pb
240-TON GRAV MILL, idle

LITTLE NOISY PROSPECT
Ione
Owners: Boswick & Krantz
MINE, underground, Au, Ag, Pb, Zn, W

LONE STAR LEASE
Conconully
Gen Mgr: T D French
MINE, Pb, Zn, Ag, idle

LONE STAR MINE
Mazama
Owner & Mgr: Tom Luke
MINE, Au, Ag, idle

LOVITT MINING CO, INC
Box 862, Wenatchee
Pres & Gen Mgr: E H Lovitt
VP: Vere McDowall
Gen Supt: D Winans
GOLDEN KING MINE, Chelan Co, underground, Silica, Au, Ag
Foreman: Charles Stumpf
Geol: A C Skerl
(Leased from Keegan Mining Co)
SMELTER, 200 tons
Assay: W G Thomson

LUCKY BOY MINE
Springdale
Owner: C F Allen
MINE, Ag, Cu, idle

MAGNUSEN, FRED
Index
BROKEN RIDGE PROP, Snohomish Co, Cu, Ag, Au, idle

MEADOW CREEK MINING CO
727 Waverly Place, Spokane
Pres: D A Munroe
Sec Treas: Mrs Wayne Richards
MINE, Ferry Co, Cu, Ag, Au, Mo
Mgr: Wayne Richards

METALINE CONTACT MINES
c/o Stanley A Easton, Kellogg, Ida
Pres: Stanley A Easton
VP: L E Hawley
Sec Treas: T Toules
MINES, Pb, Zn, (Part of prop leased to Metaline Mng & Leasing Co)

METALINE MNG & LSG CO
310-311 Radio Central Bldg, Spokane
Pres: K W Jasper
VP: E P Ryan
Sec Treas: E K Barnes
Purch Agt: Robert Small
MINES, Metaline Falls, Pb, Zn
250-TON FLOT MILL
(Properties operated by Sullivan Mng Co)

MILTON & HATHAWAY
Box 41, Curlew
GOOSMUS CR PLACER, Ferry Co, Au, idle

MINERAL CENTER MNG CO, INC
1605 28th Ave, Seattle 22
Pres: D R Harting
VPs: C T Fezzey, E R Neighbor
Sec: P R Screven
Treas: B S Hewitt
MINERAL CENTER MINE, NE of Index, Silver Cr dist, Cu, Pb, Zn, Au, Ag, idle
Engr: H E Hewitt

MINES MANAGEMENT, INC
Chronicle Bldg, Spokane
Pres & Gen Mgr: W R Green
VP & Treas: S T Anderson
Sec: L Howe
ADVANCE MINE, 6 mi S of Northport
IROQUOIS MINE, 3 mi NE of Leadpoint, underground, Zn, Pb, Ag, adit, dev
Supt: Frank Paparich Jr
Engr: R S Williams
Geol: P E Oscarson
70-TON FLOT MILL, under const

MODERN GOLD DRG CO
Regis, Mont, idle
Mgr: Lee Elier

MOONLIGHT MINING CO
Tuttle Main Serv Station, Colville
Pres: A E Wilkerson
MORNING MINE, Northport dist, Stevens Co, Zn, Pb, Ag, idle

MORRIS & LEIGHTON
Evans
YOUNG AMERICA MINE, Ag, Pb, Zn
Mgr: W C Morris
Foreman: B F Melby
30-TON FLOT MILL

MULLEN, ELMER
Chewelah
MONTGOMERY PROSPECT, Chewelah dist, Pb, Zn, Cu, Ag, Au, idle

NEW YORK-ALASKA GOLD DRG
(See North Eastern listing)
1616 Smith Tower, Seattle
VP & Gen Mgr: J K Crowdy
Asst Treas: Fannie Barley
Purch Agt: L E Robbins
(See Alaska listing for mine)

NORTHPORT MNG & DEV CO
1321 W 6th, Olympia
Pres: F Marcoe
VP: Charles Wells
Sec Treas: A E Hankins
FRISCE STANDARD MINE, near Ione, Ag, Cu, idle

NORTHWEST MAGNESITE CO
Chewelah
Pres: E A Garber
VP: C A Sargent
Sec Treas: J C Stivers
Gen Mgr: H A Ziebell
Purch Agt: L A Knight
Gen Supt: Roger L Fisk
RED MARBLE MINE, 20 mi SW of Chewelah, open pit, Magnesite
Foremen: Lloyd King, John Estes
Engr: Gene Kerns
FLOT & HEAVY MEDIA MILL
Supt: Ted Morton
Foreman: Milton Carr
REDUCTION PLANT

OLSON, CARROLL S
Box 324, Orient
BLUE MT MINE, Ferry Co, Pb, Zn, idle

ORIENT-EUREKA MINE
Orient
Gen Mgr: H C Topping
MINE, 6 mi N of Orient, Au, Ag, Pb, Zn

PACIFIC MINING CO, INC
642 Central Bldg, Seattle 4
Pres & Gen Mgr: G B Kennedy
VP: C A Shadel
PACIFIC MNG CO, 14 mi N of Deer Park, underground, W
GRAV MILL
Geol: Albert Hale
Assay: Willis Ott

PACIFIC MUTUAL SILVER LEAD
Box 1805, Spokane
Pres: C A Lyon
VP: M C Yeager
Sec Treas & Gen Mgr: C A Gray
ADDISON MINE, 11 mi SE of Keller, Ag, Pb, Zn, Cu, W, idle
Engr: O Goodsell

PACIFIC NORTHWEST ALLOYS
Mead
Pres: Leo H Timmins
Mgr: C L Wheeler Jr
MAGNESIUM PL, Mead

PEND OREILLE MINES & MET
923 Old Nat'l Bank Bldg, Spokane
Ch of Bd: S A Easton
Pres: L P Larsen
VP & Treas: Jens Jensen
Sec: A Wimberly
Gen Mgr: W L Ziegler
Purch Agt: R G Walker
Gen Supt: L M Kinney
Geol: R H Stebbins
Ch Mine Engr: A E Betchort
Elec Engr: N Rayner
PEND OREILLE MINE, 4 mi N of Metaline Falls, shaft, Zn, Pb, Ag, 1450 tons
Supt: L G Billings
Foreman: Craig Cody
WEST SIDE FLOT MILL, 750 tons
EAST SIDE FLOT MILL, 1600 tons
Supt: J C Crampton
Foreman: R W Townsend

PIONEER MINING CO
Colville
LONGSHOT MINE, Old Dominion dist, Stevens Co, Ag, Zn, Pb

PRIESTLEY MNG & MLG CO
1706 Smith Tower, Seattle
Pres: Paul Blomberg
LENNOX MINE, King Co, Au, Ag, Zn, Cu, idle

RUDEBECK, HARRY
Index
FLORENCE RAE MINE, Snohomish Co, Cu, Ag, dev

SAGINAW GOLD & COPPER MNS
Bellingham
Pres: R L Averill
SAGINAW MINE, Au, Cu, idle

SCANDIA MINING GROUP
32 E 29th Ave, Spokane
Owners: Effie, Nasburg & Hallenius
SCANDIA GROUP, Stevens Co, dev

SCOTT & SMITH
Carlton
BALES ANTIMONY PROP, Okanogan Co, Sb, dev

SEATZEN & MOOREHEAD
Colville
GOLD REEF MINE, Kettle Falls, underground, Au, Ag, idle

SILVER COIN MINING CO
Rt 1, Lake Stevens
Operator: Emmett Loth & Assoc
MINE, Snohomish Co, Au, Ag, Pb, Cu, Bi, idle

SILVER KING PROSPECT
Mazama
Owner: Alva Sharp
MINE, Okanogan Co, Au, Cu, idle

SILVER LEAF MINES CORP
401 Empire State Bldg, Spokane
Pres: H G Loop
Sec Treas: E I Fisher
SILVER LEAF MINE

SILVER STAR MINING CO
Tonasket
Pres & Gen Mgr: Edward Rowan
VP: B H Branch
SILVER STAR MINE, near Tonasket, underground, dev
200-TON MILL, dev

SILVER TRAIL MINING CO
409 American Legion Bldg, Spokane
Sec Treas: Mary P Brown
SILVER TRAIL MINE, Stevens Co, Ag, Pb, Zn, dev
DEAD MEDICINE MINE, Colville dist, Zn

SKAGIT TALC PRODUCTS
SOAPSTONE & FLAKE MICA MINE, Skagit Co

SLATE CREEK MINING CO
145 Horton St, Seattle
Pres & Gen Mgr: Harry Kramer
VP: M S Alexander
Sec Treas: W C Custis
MINE, 30 mi W of Winthrop, Au, adit
Supt: Harry Tuttle
100-TON FLOT MILL
Supt: W Stephen

SPOKANE MOLYBDENUM MINES
745 Peyton Bldg, Spokane
Pres: Luke G Bayley
MINES, Lincoln Co, Mo, Au, Ag, dev

SPOKANE PORTLAND CEMENT
725 Old Nt'l Bank Bldg, Spokane
Pres: W B Neill
VP: G M Bell
Sec: D D Hartman
NAPOLEON MINE, 130 mi N of Spokane, underground, iron ore
Supt: F W Sandoz

SULLIVAN MINING CO
Box 320, Wallace Ida
METALINE CONTACT MINE, Metaline dist, underground, Zn, Pb, dev
(See Idaho listing)

SULTAN BASIN MINING CO
Sultan
Pres & Gen Mgr: G G Startup
Sec Treas: George Heald
MINE, Cu, Ag, Au, dev
Supt: Robert Curtiss

SUNNY PEAK MINING CO
(See Glacier Silver Lead Mining Co)

TALISMAN MNG & LSG CO
730 Peyton Bldg, Spokane
Pres: H T Born
VP: Walter Hasen
Sec: Sam Perry
Treas: Clifford Taylor
TALISMAN MINE, Laurier, adit, open stopes, Ag, Cu, Pb, Zn, Cd
100-TON FLOT MILL

TOGO-TURK MINES
Fruitland
Owners: Lower & Greisbauer
Met: J F Williams
TOGO & LUCKY BOY MINES, 6 mi E of Fruitland, underground, Cu, Ag, 50 tons
50-TON FLOT MILL

TUNGSTEN MNG & MLG CO
711 Hutton Bldg, Spokane
Pres: P H Casey
Sec Treas: O G Whitham
GERMANIA MINE, Stevens Co, W, dev
GERMANIA MILL, dev
Supt: Henry Becker

UNITED COPPER MINES CO
10 S 3rd St, Yakima
Pres: A M Conway
MINE near Chewelah, Ag, Cu, idle
Mgr: Chas Delk

U S GYPSUM CO
(See North Eastern listing)
OPEN PIT MINE, Evans, limestone

UTILITY MINING CO
Robe & Silverton, Snohomish Co
Pres: M Bsharah
MACHINAW GROUP, Snohomish Co, Au, Cu, Ni, idle
Gen Mgr: R D Taft
Mech Engr: D H Taft
FLOT MILL
Met: Wm McCarty

VELMA MINES
515 Malaga St, Wenatchee
Pres & Gen Mgr: L G Olds
VELMA MINE, Wenatchee, open pit, Au, Ag, Hg, idle

WINDFALL MINE
Rt 4, Arlington
Partners: Benson & Blomquist
MINE, Kittitas Co, Au, Ag

WHITHAM, JOHN W
703 Seaboard Bldg, Seattle
CONEY BASIN MINES, King Co, Au, Ag, Cu, Pb, Zn, idle

YOUNG AMERICAN MINES, INC
416 Virginia St, Seattle
Pres: A J Sandtner
YOUNG AMERICA MINE, 25 mi NW of Coleville, dev
30-TON FLOT MILL
(Leased to Bonanza Lead Co)

WYOMING

AMERICAN COLLOID CO
Merchandise Mart Plaza, Chicago, Ill
Pres: Paul Bechner
VP: W D Weaver
Purch Agt: Roy H Harris
Ch Chem: A G Clem
COLLOID MINE, 8 to 30 mi NW of Upton, placer, Bentonite, 60,000 tons yearly
MILL
Supt, Mine & Mill: Orville Horn
BELLE MINES, 10 to 20 mi NW of Belle Fourche, S Dak, placer, Bentonite, 170,000 tons yearly
MILL
Supt, Mine & Mill: Edwin Busfield

BAROID SALES DIVISION, NAT'L LEAD CO (See Texas listing)
CLAY SPUR, OSAGE & COLONY PL, Colony, open pit, Bentonite
DRY GRINDING
Supt: D M Middleton
(P O, Belle Fourche, S Dak)

BEAR LODGE MINING CO
Stavin Bldg, Hibbing, Minn
Pres: H H Harrison
MINES, 8 mi N of Sundance, rare earths, Fe, Mn, dev

BENTON CLAY CO
Casper
Pres: W F Clark
VP: Fred Carr
Sec Treas: Henry Burgess
Field Mgr: I Kreiner
MINES, near Casper & Kaycee, open pit, Bentonite
MILL, Casper

BLACK HILLS BENTONITE CO
Moorcroft
Pres: H T Thorson
Gen Mgr: A C Harding
MINE, Moorcroft & Upton, open pit
Supt: Ralph McCoy
180-TON MILL, drying & grinding
Supt: Boyd Ash

COLORADO FUEL & IRON CORP
(See Colorado listing)
SUNRISE MINE, Sunrise, underground, Fe
Supt: M L Sisson

EASTERN CLAY PRODUCTS, INC
Belle Fourche, S Dak
Pres: Vernon F Taylor
VP: N J Dunbeck
MINE, Crook Co, open pit, Bentonite
Mgr & Purch Agt: K L Arthur
Supt: J A Brown
MILL, Moorcroft

GREAT WESTERN SUGAR CO
Box 5308, Terminal Annex, Denver 17, Colo
Pres: F A Kemp
MINE, Horse Creek, underground, limestone, chemical, ballast, rip-rap
Capacity: 125 tons per hour

INTERMOUNTAIN CHEM CORP
Box 872, Green River
Gen Mgr: C A Romano
Elec Engr: L Ruffini
Mech Engr: H F Young
TRONA MINE, 20 mi W of Green River, shaft, rm-pillar stopes, Trona
Supt: G B Gaylord
Asst Supt: R F Loue
REFINING PL, Green River
Gen Supt: N E McDougal

INTERSTATE CHEM CO
2303 Northern Life Tower, Seattle, Wash
MINE & MILL, Cody, Gypsum

MONOLITH PORTLAND MIDWEST
OXIDE DIVISION, Laramie
Pres: Coy Burnett
Supt: F J Anderson
Mgr: H D McBride
Res Engr: W C Graham
60-TON PILOT PLANT, production of Alumina from Anorthosite, idle

PHOSPHATE FERTILIZER, INC
Kemmerer
Pres: Mayben Fox
VP: Joe Profaizez
Sec Treas: Arthur Piz
Gen Mgr: Matt Bertagnolli
PHOSPHATE MINES, INC, 9 mi N of Susie, underground, Phosphate, idle
200-TON MILL, Susie
Foreman: Rex Borino

PIONEER CARISSA GOLD MINES
617 Zions Savings Bank Bldg, Salt Lake City, Utah
Pres: Verdin R Johnson
Gen Mgr: G B Colemere
Purch Agt: E U Swallberg
VP: Ray G Wenger
CARISSA MINE, South Pass City, underground, Au, Ag, idle
100-TON CYANIDE MILL

SAN FRANCISCO CHEM CO
Box 857, Montpelier, Ida
Pres & Gen Mgr: D L King
VP: W S Taylor
Sec Treas: Rex L Jones
LEEFE MINE, 2 mi NW of Sage, open pit, Phosphate, 1,000 tons
Purch Agt: S D Dodds
Foreman: Art Fredrickson
OPEN PIT, PHOSPHATE ROCK & CRUSHING PLANT, 80,000-tons mo
Foreman: C S Stephens

SOIL SULPHAID DIST CO
Box 606, Thermopolis
Pres: Geo Sinton
Gen Mgr: Maynard Sinton
MINE, Thermopolis, open pit, 400-yd dragline, S, Gypsum

THORSON, HARRY T
Osage
BENTONITE MINE, 100,000 tons yearly

UNITED PRODUCTS CO, INC
Rock River
MINE, W of Rock River, open pit, Bentonite
MILL, Rock River

VANDERWALKER, JE & CO
Victor, Colo
Owner: C F Brown
MINE 4 mi S of South Pass City, Au, dev

WESTVACO CHEM DIV, FOOD MACH & CHEM CORP, Box 872, Green River
Pres: W B Thom
VP: M Y Seaton
Gen Mgr: C A Romano
WESTVACO MINE, 24 mi W of Green River, underground, Trona
Supt: G B Gaylord
Asst Supt: R F Love
MILL
Supt: A P McCue

WHITE HORSE MINING CO
Atlantic City
Mgr: E R Lund
DIANA MINE, underground, Au, dev

WYODAK CHEMICAL DIVISION, FEDERAL FOUNDRY SUPPLY CO
4800 East 71st St, Cleveland, Ohio
Pres: Ralph Ditty
Gen Mgr: Louis H Heyl
MINES, Upton & Colony
Purch Agt: J E Hollmeyer
Supt, Upton: Carl Barritt
Pl Mgr, Upton: O M Ellerman

WYOMING-GULF SULPHUR CORP
Box 936, Cody
Pres & Gen Mgr: W H Marquette
VP: H R Aldredge Jr
Sec: D U Emmert
Treas: H R Aldredge
Purch Agt: Kenneth Miller
Cons Engr: Harry Pollard
CEDAR MT SULPHUR MINE, 3 mi W of Cody, open pit, S conc, 150 tons
100-TON FLOT MILL, at mine
Mine Supt: John Mollet
Mill Foreman: Art Barry

LAKE SUPERIOR

MICH, MINN, WISC

BAKER, G M, MLG CO
Benton, Wisc
TAILINGS, various mines, Pb, Zn
HOSKINS MILL, Shullsburg, Wisc, 350-ton flot

BENTON MILLING CO
Benton, Wisc
Pres: J M Cherry
Sec Treas & Gen Mgr: F J Cherry
CHAMPION MINE, 1 mi S of New Diggings
CHAMPION MILL, 250-ton flot, Zn
Supt: Lee Powers

CALUMET & HECLA CONS COPPER CO, 1 Calumet Ave, Calumet, Mich
Pres: E R Lovell
VP: A C Petermann
VP & Gen Mgr: O A Rockwell
Purch Agt: L H Donald
AHMEEK, ALLOUEZ, CALUMET, CENTENNIAL, HECLA, IROQUOIS, KEARSARGE, PENINSULA & SENECA MINES, Calumet, underground, Cu
Mgr: C A Campbell
Chief Engr: H S Donald
Ch Geol: T M Broderick
Mech Engr: R R Spencer
Elec Engr: W L Hanson
Safety Engr: Geo Gedge
8,000-TON GRAV FLOT MILL
Supt: R K Poull
CALUMET & HECLA SMELTER, Hubbell, Mich, 5 reverb Cu furnaces capacity of 8,000,000 lbs refined Cu monthly
Met: Raymond Marcotte
Assay: R Gertz
WISCONSIN BRANCH MN, 4 mi S of Shullsburg, Wisc, underground, Pb, Zn
Branch Mgr: John Lasio
Foreman: R Heratrom
Engr: G F McKereghan
1200-ton FLOT MILL
Supt: George Sullivan
Prod: 800 tons

CERTAIN-TEED PRODCTS CO
(See North Eastern listing)
Box 4, Grand Rapids 1, Mich
OPERATIONS, Grand Rapids, underground, Gypsum
Gen Mgr: A H Ten Elsof

CHARLESON IRON MNG CO
Power Bldg, Box 335, Hibbing, Minn
Pres & Gen Mgr: E F Remer
VP & Gen Supt: C H Remer
Purch Agt: A T Steele
IRON OPERATIONS from stockpile to 1,000-ton grav mill, Charleson conc
Supt: J C Henry

CLEVELAND-CLIFFS IRON CO
(See North Eastern listing)
2011 2nd Ave E, Hibbing, Minn
MINES in Minn, Fe
Mgr: G J Holt
Dist Supt: W A Pakkala
Supt: H C Bolthouse
AGNEW MINE, Hibbing, underground
SARGENT MINE, Keewatin, undgrnd
Supt: J J Foucault
HAWKINS MINES, Nashwauk, open pit
WASHING PLANT
Supt: P P Swanson
HILL-TRUMBILL MINE, Minn marble, open pit
WASH & HI-DENSITY PL, Calumet
Supt: H J Leach
HOLMAN-CLIFFS MINE, Taconite, pit
WASH & HI-DENSITY PL, Taconite
Supt: W A Pakkala
CANISTEO MINE, Coleraine, open pit
WASH & HI-DENSITY PL, Coleraine
Supt: E L Bemis
ATKINS MINE, Kiney, openpit
WANLESS MINE, Buhl, open pit
Supt: R Erickson
MINES in Mich, Fe
OHIO-WEBSTER, Baraga Co, open pit
SPIES-VIRGIL, Iron Co, underground
ATHENS, Marquette Co, underground
BUNKER HILL, Marquette Co, undgrnd
CAMBRIAN-JACKSON, Marquette Co
CLIFFS SHAFT, Ishpeming City, undgr
LLOYD-EAST LLOYD, Marquette Co, underground
MAAS-RACE COURSE, Marquette Co, underground
MATHER "A" & "B", Marquette Co, underground
TILDEN, Marquette Co, open pit

COONS, E W, CO INC
Grant & First, Hibbing, Minn
Pres: W C Cohoe
Gen Supt: R A MacDonnell
JULIA, GENOA SPARTA & GENOA FEE MINES, Virginia, Minn, Fe

COPPER RANGE CO
(See Northeastern listing)
Federal St, Houghton, Mich
MINING DIVISION, Painesdale, Mich
Gen Mgr: W E Romig
CHAMPION MINE, 10 mi S of Houghton, underground, Cu, 750 tons
Purch Agt: B D Noetzel
Foreman: Ernest Hitchens
Mast Mech: W J Andrews
Ch Elec: Martin Meyers
Safety Engr: Philip Vertner
Mine Engr: Peter Steinen
FLOT MILL, Freda, Mich
Supt: I T Bowman
Foreman: Matt Salminen
Assay: Ross Gamble
SMELTER, Houghton, 50,000,000 lbs
(See White Pine Copper Co)

CUBA MINING CO
Platteville, Wisc
Treas: A W Heins
Bus Mgr: E G Deutman
Purch Agt: F L Johns
ANDREWS MINE, 4 mi SW of Shullsburg, Wisc, Zn, Pb
Supt: Francis Cherry
LYNE MILL, grav
Prod: 12,000 tons annually

DATES MINING CO
37th & 7th Ave W, Hibbing, Minn
PENNINGTON MINE, Cuyuna Range, 2 mi NW of Ironton, Minn, open pit, Fe
HMS & GRAV MILL
Supt: P H Ramsden
(Leased to Rhude & Fryberger)

DODGEVILLE MINING CO
824 Gay Bldg, Madison, Wisc
Part: J J MacDonald
Gen Mgr & Part: C W Singer
DODGEVILLE #3 MINE, Dodgeville, Wisconsin, Pb, Zn, 250-tons
Gen Supt: E J Fredricha
Foreman: J W Wagner
150-TON GRAV FLOT MILL
Supt: John Becakircher
Foreman: Walter Cook
Flot Mill Fore: Alvin Johnson

DOUGLAS MINING CO
(See North Eastern listing)
Operating Subsidiary, M A Hanna Co
Gen Mgr: R C Fish, Duluth, Minn
MINES, Mesabi Range, Minn, Fe
Gen Mgr, Minn Mines: R W Whitney, Hibbing, Minn
DOUGLAS MINE, Balkan, open pit
WASH PL, Chisholm
Supt: R M Gross
NEVILLE RESERVE, Stuntz

GIRMAN MINING CO
Mineral Point, Wisc
Operator: John Girman
MINE, Pb, Zn

GLOBE IRON CO
Jackson, Ohio
Ch of Bd: E A Jones
Pres: J H Jones
VP: J W Morgan
Sec: W Pfancuff
Gen Mgr: W R Doell
GLOBE-CORNELL MINE, 2 mi N of Iron Mt, Mich, Fe, open pit, 200 tons

GRAND RAPIDS PLASTER CO
1204 Peoples Nt'l Bank Bldg, Grand Rapids 2, Mich
MINE & MILL, Grand Rapids, Gypsum

HALEY-YOUNG MINING CO
2223 First Ave, Hibbing, Minn
Pres: E A Young
Sec: D D Haley
ELBERN MINE, 2 mi SE of Fraser Minn, open pit, Fe
Supt: Leo Cashen
Fore: Phillip Solmonson
Assay: Lerch Bros, Inc

HANNA, M A, CO
(See Butler Bros, Douglas Mining Co, Mahland Ore Co, Morton Ore Co, Ozark Ore Co, Philbin Mining Co, Richmond Iron Co, South Agnew Mining Co, St James Mining Co)

HANNA COAL & IRON CORP (operating subsidiary) 1300 Leader Bldg, Cleveland 14, Ohio
Ch of Bd: G M Humphrey
Pres: J H Thompson
VPs: R C Fish, G W Humphrey, P G Harrison, A B Kern, H L Pierce
Sec: L W Spang
Treas & Asst Sec: W C Pieper

MINES, Fillmore Co, Minn, open pit, Fe
Gen Mgr Minn Mines: R W Whitney, Hibbing
BLY, HADLAND, SIMON-BLY MINES
WASH PL, Ostrander
Supt: L T Kreuz
MINES, Mich, Fe
Gen Mgr: S E Quayle, Iron River
GROVELAND, CANNON, HIAWATHA # 1 & 2, HOMER-MINCKLER-CARDIFF, WAUSECA-ARONSON, NEW RICHMOND MINES

HANNA IRON ORE CO (operating subsidiary) 1300 Leader Bldg, Cleveland 14, O
Ch of Bd: G M Humphrey
Pres: J H Thompson
VPs: P G Harrison, G W Humphrey, F M Hesse, H L Pierce
Sec: F M Hesse
Treas & Asst Sec: C W Gardner
Gen Mgr, Minn Mines: R W Whitney, Hibbing
MINES, Mesabi Range, Minn, Fe
BECKFELT RESERVE, Bass Br Twp, idle
DRAPER ANNEX REXERVE, Greenway Twp, open pit
WASH PL, Calumet, idle
Supt: John Kleimola
FINNEGAN RESERVE, Bass Br Twp, idle
LINDBRIGAN, NATCHEZ & PODEGAMA RESERVES, Bass Br Twp, idle
PARCEL #3 RESERVE, Coleraine, idle
SECT 18, RESERVE, Stuntz Twp, pit
MINES, Cuyuna Range, Minn, Fe
BARROWS RESERVE, Crow Wing Twp
CUYUNA, DUNN & TABERT RESERVES, Oak Lawn Twp, idle
N W I & WALKER RESERVES, Noaky Lake Twp, idle
ZENO RESERVE, Mn, idle
WASH, SCREEN & SINTER PL, Crosby
Supt: G B Hunner

HANNA ORE MINING CO (operating subsidiary) 1300 Leader Bldg, Cleveland 14, O
Ch of Bd: G M Humphrey
Pres: J H Thompson
VPs: P G Harrison, G W Humphrey, H L Pierce
Sec: L W Spang
Treas & Asst Sec: C W Gardner
Gen Mgr: R C Fish
MINES, Mesabi Range, Minn, Fe
Gen Mgr, Minn Mines, R W Whitney
BOVEY-DE LAITTRE RESERVE, & FARGO RESERVE, Grnd Rapids Twp, idle
ENTERPRISE RESERVE, Virginia, Idle
GORDON ANNEX, GORDON, MESABI CHIEF & STEIN MINES, Nashwauk Twp
IMPRO B, & NORPAC B, & SARGENT RESERVES, Hibbing
MISSISSIPPI # 1 & 3 MINES, Keewatin, open pit
WASH PL, Buhl

HEDMAN MINING CO
Hibbing, Minn
Pres & Gen Mgr: Carl Hedman
VP: Hugh H Harrison
Sec Treas: D J Keeler
CROXTON & DREW-SYME MINES, Balkan Twp, Mesabi Range, open pit, Fe

HOFER, FRED & SONS
Shullsburg, Wisc
DEROUCHER MINE, Zn, Pb, 850 tons mo

INLAND STEEL CO
(See North Central listing)
IRON ORE OPERATIONS
Mgr, Mines & Quarries: A J Cayia, Manistique, Mich
Mgr, Raw Materials Dept: C B Jacobs, Ishpeming
BRISTOL MINE, Crystal Falls, Mich,
Supt: W P Reed
CAYIA MINE, Crystal Falls, Mich
Supt: R O Marden
GREENWOOD MINE, Ishpeming, Mich
Supt: E W Whitman
MORRIS MINE, Ishpeming, Mich
Supt: R W Edwards
SHERWOOD MINE, Iron River, Mich
Supt, Menomine Rng: F D Pearson
AMOUR #1 & 2 MINES, Ironton, Mich
Supt: A T Anderson
FLUORSPAR OPERATIONS
Mgr: A J Cayia, Manistique, Mich

JACKSON IRON & STEEL CO
(See North Central listing)
BRADLEY MINE, Iron Mt, Minn, Fe 32,000 tons yearly
(Operated by Edward C Bradley & Sons)

JESSIE MINING CO
Grand Rapids, Minn
Gen Supt: R N McGiffert
IRON MINING

JONES & LAUGHLIN STEEL CORP
First Nat'l Bank Bldg, Virginia, Minn
MINNESOTA ORE DIVISION
Mgr: G E Levesque
Gen Supt: H F Kullberg
Res Engr: H T Caddy
Ch Acct: F S Tonnesen
MINES, Mesabi Range, Minn, Fe
HILL ANNEX MINE, Calumet
Supt: R O Brandon
MILL, screening, crushing, wash & heavy media
Supt: George Eilertson
SULLIVAN #2 MINE, Calumet
Supt: R O Brandon
LOUGYEAR MINE, Hibbing
Supt: John F Linden
MILL, screen, crush, wash

COLUMBIA-MISSABE MT MINES, Virginia
Supt: P W Kruse
Asst Supt: H W Gillespie
MILL, screen, crush, wash
GRANT MINE, Buhl
Supt: J F Linden
MILL, screen, crush, wash & heav med
SCHLEY-PETTIT MINES, Gilbert
Supt: P W Kruse
Asst Supt: H W Gillespie
MILL, screen, crush, wash
WENTWORTH MINE, Mesaba, dev
Supt: P W Kruse
Asst Supt: H W Gillespie
MILL, under const
JONES & LAUGHLIN ORE CO
Ishpeming, Minn
Pres: C C Henning
Gen Supt: R W Braund
TRACY MINE, Negaunee, Mich shaft, under dev
Supt: R L Balioni
Asst Supt: H J Christy
Engr: W A Benson

LITTLE BENNY MINING CO
Shullsburg, Wisc
ANNIE WALTON & MONROE MINES, Zn, Pb, dev

LITTLE GRANT MINING CO
Benton, Wisc
Mgr: A L Murray
LITTLE GRANT MINE, Benton, Wisc, underground, Pb, Zn
450-TON MILL
(Leased to E P Scallon)

MAHLAND ORE CO
1300 Leader Bldg, Cleveland 14, O
(Operating subsidiary, M A Hanna Co)
Pres: J H Thompson
VPs: H L Pierce, J D Block Jr
Sec: G W Humphrey
Treas & Asst Sec: CW Gardner
Asst Treas: S L Engel
Gen Mgr: R C Fish, Duluth, Minn
Mgr Mich Mines, W E Quayle, Iron River, Mich
PROPERTY, Wakefield, Mich, Fe

MAYER & THIEDE
Shullsburg, Wisc
ROWE LEAD MINE, Shullsburg, Pb

MEEKER'S GROVE MNG CO
305 Broadway St Platteville, Wisc
LIBERTY & LEO V MINES, 5 mi NE of Cuba City, Wisc, underground, Zn
400-TON GRAV FLOT MILL, 1 mi from Liberty Mine, under const

MIFFLIN MINING CO
c/o Jack Tracy, Platteville, Wisc
Pres & Gen Mgr: Richard Metcalf
COKER MINE, Mifflin, Wisc, dev
125-TON FLOT MILL

MINERAL MINING CO
Box 391, Iron River, Mich
Pres: W D Van Dyke Jr
Gen Mgr: F E Brown
Asst Mgr: W F Brown
BETA-NANAIMO & BUCKHOLTZ MNS, Fe, dev
Purch Agt Leona Glemboski

MONTREAL MINING CO
1200 Hanna Bldg, Cleveland 15, O
Pres: G G Wade
VP: Cortney Burton
Sec: A C Bishop
Treas: R C Norton
MONTREAL MINE, Montreal Wisc
(See Oglebay Norton & Co)

MOORE, W S CO
Brooklyn Rd, Hibbing Minn
Pres: W S Moore
Sec: H A Nelson
Gen Mgr: H E Reese
Purch Agt: J H Steele
Gen Supt John Johnson
JUDSON MINE 1 mi S of Buhl Minn open pit, Fe, dev
PRINDLE MINE, 1 mi W of Virginia, Minn, open pit, Fe
HMS MILL

MORTON ORE CO
Hibbing, Minn (M A Hanna Co, Agts)
Gen Mgr: R W Whitney
Asst Gen Mgr: E S Mollard
Purch Agt: G H Shields
MORTON MINE, 2 mi W of Hibbing, Fe dev, dragline-conveyor stripping
Supt: L M Breedvold
Asst Supt: R F Anderson
Foreman: M Englund

MURRAY & RICHARDS
500 Minerva St, Darlington, Wisc
Mgr: J H Richards
DOYLE MINE, Zn, Pb, 700 tons month

NATIONAL GYPSUM CO
(See North Eastern & Central listings)
QUARRY & PLANT, National City, Mich, Gypsum
Pl Mgr: H E Scifres
Quarry Supt: R H Allen

NORTH RANGE MINING CO
Negaunee, Mich
Pres & Gen Mgr: R S Archibald
VP: F F Book
Sec: E S Holmgren
Asst Mgr: C W Nicolson
Geol: L E Smith
Ch Elec: G H Peterson
BLUEBERRY MINE, Ishpemang, Mich
Supt: A J Guscott
Capt R L Prideaux
Purch Agt: P A Alexander
BOOK MINE, Alpha, Mich
Supt: J C Kirkpatrick
Capt: Charles Coole
CHAMPION MINE, Champion, Mich
Supt: J A Nicolson
Capt: Bryan Farragh
WARNER MINE, Amasa, Mich
Supt: J C Kirkpatrick
Capt: C A Clements

OGLEBAY NORTON & CO
Hanna Bldg, Cleveland 15, Ohio
NORTHERN OFFICE, 300 Christie Bldg, Duluth Minn
VP: Frank J Smith
Ch Engr: D S Young
Dev Engr: H K Martin
Elec Engr: W W Viebahn
Purch Agt: E A Lambert
MONTREAL MINING CO, agent for, (See Montreal Mining Co)
MONTREAL MINE, Montreal Wisc, Fe
Gen Supt: Roy A Bowen
Supt: C A Bjork
Asst Supt: C F Guenther
RESERVE MINING CO, agent for,
Supt: Peter Warhol
Engr: F W Erickson
ST JAMES MINING CO, manager for, (See St James Mining Co)
Supt: B L Knudsen
Gen Fore: T H Trihey

OLIVER IRON MINING CO
(Subsidiary of U S Steel Corp)
Wolvin Bldg, Duluth 2, Minn
Pres: R T Elstad
VP, Oper: J E Machamer
VP, Research: W L Maxon
Sec: A R Morton
Treas: R L Larson
Compt: R B Henley
Asst to VP: W N Matheson Jr
Gen Mng Engr: L J Severson
Supt, Gen Mng Engr Div: N A Moberg
Geol: R H B Jones
Supt, Ore Movements: S Naismith
Supt, Benefic: A T Kownen
Asst Supt, Benefic: W P Morris
Ch Engr: C N Bailey
Dir, Ind Rel: R O Hawkanson
Purch Agt: G A Engle
Ch Grader: Gordon Sharbach
EASTERN DIST
Gen Supt: W J Kaiser
Asst Gen Supt: I O N Swanson
Maint Supt: A R Mc Leod
Ch Mng Engr: P V Burgett
Ch Chem: I R Lerohl
CANTON MINE, Biwabik, Mesabi Range, Minn, open pit
Supt. K H McInnes
EVELETH MINES
Supt: J M Johnson
Asst Supt: E J E Olson
Gen Mng Capt: F D Hoover, Jr
MT IRON MINE, Mt Iron, Mesabi Range, open pit
Supt: J H Rubow
Asst Supt: L E McKenzie
PIONEER MINE, Ely, Vermilion Range, underground
Supt: L E Dick
Capt: J Pouchnik
ROUCHLEAU MINE, Virginia, Mesabi Range, open pit
Supt: L S Campbell
Gen Pit Fore: W H Wright
ROUCHLEAU C & S PLANT
Supt: L S Campbell
SIBLEY MINE, Ely, Vermilion Range, underground
Supt: L E Dick
Capt: J D Warner
SOUDAN MINE, Breitung Twp, Vermilion Range, underground
Supt. E M Holmes
Capt: G J Nemanich Jr
SPRUCE MINE, Eveleth, Mesabe Range open pit
Gen Pit Fore: C V Wargstrom
HIBBING-CHISHOLM DIST
Gen Supt: J H Hearding, Jr
Asst Gen Supt: J Chisholm
Maint Supt: C R Burton
Ch Engr: W P Wolff
Ch Chem. O L Forsberg
GODFREY MINE, Chisholm, Mesabi Range, underground
Supt: T W Been
Asst Supt: T H Cain
Capt: A F Hulme
HULL-RUST MINES, Hibbing, Mesabi Range, open pit
Supt: M J Forsmark
asst Supt: N G Nelland
HULL C & S PLANT
Gen Fore: P A Cheever
MONROE MINE, Chisholm, Mesabi Range open pit
Supt: R W Segar
Gen Pit Fore: J C Cullis
PILLSBURY MINES, Balkan Twp, Mesabi Range, open pit & underground
Supt: H M Pickering
Asst Supt: E V Nelson
SHERMAN MINE, Balkan Twp, Mesabi Range, open pit
Supt: S R Micka
Asst Supt: E C Silver
Gen Pit Fore: W K Reichel

CANISTEO DIST
Gen Supt: E A Friedman
Ch Chem: E R Bechtel
Ch Engr: L E Battles
Mast Mech: R F Knight
ARCTURUS-GROSS MARBLE, Taconite, Mesabi Range, open pit
Supt: M E Johnson
TROUTE LAKE CONCENTRATOR
Supt: K F MacAlpine
WALKER MINE, Coleraine, Mesabi Range, open pit
Supt: J H Harrison
Gen Pit Fore: H C Ernst
GOGEBIC DIST
Supt: H W Byrne
Asst Supt: F W Denton Jr
Ch Engr: T G Roy
Ch Grader: E W May
GENEVA MINE, Ironwood, Mich, undgr
Capt: R Lindberg

PACIFIC ISLE MINING CO
2521 First Ave, Hibbing, Minn
Pres: H H Harrison
Gen Mgr: J D Boentje Jr
Supt: R H Chisholm
Office Mgr: K J Keeler
Gen Counsel: E T Binger
Pl Foreman: E T Leppanen
Supt: Arne O Tuomala
CYPRUS, DALE (idle), KERR, LAMBERTON & SMITH MINES, Stuntz Twp, Mesabi Range, Minn, open pit, Fe
MISSABE MT MINE, Franklin Village
NORDINE MINE, Stuntz Twp
NORTH SHIRAS MINE, Buhl Village
WACOOTAH MINE, Mt Iron Village
YORK MINE, Nashwauk

PENNSYLVANIA SALT MFG CO
1000 Widener Bldg, Philadelphia, Pa
SALT PLANT, Wyandotte, Mich

PHILBIN MINING CO
(Operating subsidiary, M A Hanna Co)
(See North Eastern listing)
WEGGUM MINE, Mesabi Range, Minn, Fe

PICKANDS, MATHER & CO
(See North Eastern listing)
700 Sellwood Bldg, Duluth 2, Minn
Gen Mgr: A D Chisholm
Asst Mgr: J C Metcalf, Kenneth Duncan
Purch Agt: D A Bruneau
Exec Asst: C F Trowbridge
Oper Asst: E L Joppa
Ch Mng Engr: O L Yauch
Ch Mech Engr: A C Butterworth
HIBBING DIST, Mesabi Range, Fe
Gen Supt: E J Fearing
Asst Gen Supt: M L Bradt
Dist Mng Engr: R W Sullivan
Ch Clk: Lee McNulty
Dist Safety Supt: C E Hager
CRETE MINING CO, ALBANY & ST ANTHONY # 2 RESERVE
Supt: T R Tregembo
BENNETT MINING CO, BENNETT MINE, Wash Pl at Keewatin
Supt: A E Schneider
UTICA MINING CO, CARSON LAKE MINE, Carmi
Asst Supt: E T Lang
BALKAN MINING CO, DANUBE MINE, Wash Pl at Bovey
Supt: D E Coughlin
ERIE MINING CO, ERIE RESERVES
HURON LAND CO, HURON RESERVES
MAHONING ORE & STEEL CO, MAHONING MINE & RESERVES
Supt: W G Brown
ONTARIO IRON CO, ONTARIO RESERVE
HOYT MINING CO, SCRANTON MINE, crushing pl, wash pl, Hibbing
Supt: W D Webb
SYRACUSE MINING CO, SYRACUSE RES
EAST MESABI DIST
Gen Supt: T J Thielman
CORSICA IRON CO, CORSICA MINE, crushing & wash pl, Gilbert
Supt: H F Sears
BIWABIK MINING CO, BIWABIK MINE crush & Benefic Pl, Biwabik
Supt: J M Shields
LAKE MINING CO, EMBARRASS MINE, crushing pl, Biwabik
Supt: R F Kohn
ERIE MINING CO, ERIE MINE Aurora
Asst Supt: Robert Bell
CONC PL, Biwabik
Supt: G C Watts
ELY DIST, Vermillion Range
VERMILLION MINING CO, ZENITH MINE
Supt: B S Richards
CUYUNA DIST, Cuyuna Range
Supt: J P Schemmel
Dist Mng Engr: G C Chamberlain
Ch Clk: O W Peterson
CUYUNA ORE CO, MAHNOMEN MINE, Crushing Pl, Ironton
YOUNGSTOWN MINES CORP, RABBIT LAKE MINE
SAGAMORE ORE MINING CO, SAGAMORE MINE, Crushing & Drying Pl Riverton
GOGEBIC DIST, Ironwood, Mich
Gen Supt: W A Knoll
Asst Gen Supt: C D Bailey
Dist Mng Engr: H W Johnson
Ch Clk: B D Kennedy
Dist Safety Supt: Geo Gerry
ODANAH IRON CO, CARY MINE, Hurley, Wisc, underground
Supt: A L Johnson
YOUNGSTOWN MINES CORP, NEWPORT MINE, Ironwood, underground
Supt: H L Schieber

ANVIL PALMS, KEEWENAW MINES, Bessemer, Mich, underground
Supt: R L Jose
PURITAN MINING CO PETERSON MINES, Bessemer, Mich, underground
Under dev
Supt: H L Schieber
PLYMOUTH MINING CO, PLYMOUTH MINE, Wakefield, Mich, open-pit
Supt: E C Sponberg
SUNDAY LAKE IRON CO, SUNDAY LAKE MINE, Wakefield, Mich, underground
Supt: R D Hodge
PALMERMINING CO, VOLUNTEER MINE, Palmer, Mich, open-pit,
Supt: E C Sponberg
MENOMINEE DIST
Gen Supt: H J Richards
Dist Mgr Engr: W E Seppanen
Ch Clk: S K Brew
Dist Safety Supr: L A Schutz
PICKANDS MINING CO, DAVIDSON MINE, Iron River, Mich, underground
JAMES MINING CO, JAMES MINE, Iron River, Mich, underground
VERONA MINING CO, BUCK UNIT MINE, Caspian, Mich, underground

PITTSBURG MINING CO
Benton, Wisc
Sec-Treas: Dale Gehrke
Zn, Pb

QUINCY MINING CO
63 Wall St, New York, New York
Sec-Treas: A M Mansfield
QUINCY RECLAMATION PLANT, Mason, Mich, Cu

REDFEARN, ORTHEL
Leadmine, Wisc
JUG HANDLE MINE, Zn
Prod: 350 tons monthly

REPUBLIC STEEL CORP
Republic Bldg, Cleveland 1, Ohio
Pres: C M White
VP: W M Kelley
Ass't VP: E B Winning
Purch Agt: F J Laskey, Cleveland
SUSQUEHANNA MINE at Hibbing, Minn; openpit
GRAV CUSTOM WASHER at Hibbing
Mine Supt: J H Hocking
Ass't Mine Supt: M G Woodle
Engr: B K Dutton
Day Pit Foreman: John O Pearson
Night Pit Foreman: Elwood Ferris
Mech Engr & Elec Engr: Victor Crego
Assy: A J Mayheu
Prod: 1,100,000 tons yearly
PENOKEE MINE at Ironwood, Mich, underground, Fe
Mine Supt: A J Christenson
Ass't Mine Supt: Joseph Zuraw
Ch Engr: E W R Butcher, Duluth
Mine Foreman: Oscar Holst
Mech & Elec Engr: Victor Crego, Duluth
Assy: John Trevarthen
Prod: 600,000 tons yearly
ST PAUL MINE At Keewatin, Minn, open pit,
GRAV MILL
Mine Supt: J H Hocking
Ass't Mine Supt: M G Woodle, Hibbing
Mng Engr: B K Dutton, Hibbing
Mng Foreman: E M Murphy
Mech & Elec Engr: Victor Crego
Assy: A J Mayheu
Prod: 350,000 tons yearly
STEVENSON MINE at Stevenson, Minn open-pit, Fe
GRAV MILL
Mine Supt: J H Hocking
Asst Mine Supt: M G Woodle
Mng Engr: B K Dutton
Pit Foreman: L J Marinello
Mech & Elect Engr: Victor Crego
Assy: A J Mayheu
Prod: 225,000 tons yearly
TOBIN MINE at Crystal Fall, Mich: underground, Fe
Mine Supt: E H Anderson
Mine Foreman: Emil Johnson
Ch Engr: E W R Butcher
Mech & Elec Engr: Victor Crego
Assy: J H Meyer
Prod: 432,000 tons yearly

RHUDE & FRYBERGER
Box 779, Hibbing, Minn
Partners: A S Rhude, L M Fryberger
(See Dates Mining Co)

RESERVE MINING CO
(Owned by Republic & Armco Steel Corps)
Operating Co: Oglebay, Norton & Co, which see
RESERVE MINE, Babbit, Minn
CRUSHING PLANT, Babbit, Minn
TACONITE MILL, Beaver Bay, under const.

RICHMOND IRON CO
(M A Hanna Co, operating subsidiary)
1300 Leader Bldg, Cleveland 14, Ohio
Pres & Dir: J H Thompson
VP: F G Harrison
VP & Dir: H L Pierce
VP & Dir: C W Beck
Secy: G W Humphrey
Treas & Asst Sec: C W Gardner
Asst Treas: S L Engel
Gen Mgr: R C Fish, Duluth, Minn
Mgr Mich Mines: S E Quayle, Iron River, Mich
MINE at Palmer, Mich, Fe

ST JAMES MINING CO
(See Northeast listing)
Pres: A F Peterson
VP: C L Kingsbury & H S Taylor
Sec: G C Nichols
Treas: E W Sloan, Jr
ST JAMES MINE, Aurora, Minn, Fe
Supt: B L Knudsen

SKUBIC BROTHERS CO
705 6th Ave N, Virginia, Minn
Supt: Frank Skubic
AJAX MINE, Biwabik, open pit, Fe
VIRGINIA MINE, Eveleth, Mesabi Range, Minn, open-pit, Fe, stripping operations

SNYDER MINING CO
(See Northeast listing)
Minnesota Office: 1101 Alworth Bldg, Duluth
Gen Mgr: O A Sundness
Auditor: B C Anderson
Dir of Boats: W C Sibbald
MINES on Mesabi Range, Minn, Fe
Range Office: Chisholm
Mech Engr: A Tancig
Ch Engr: A C Borgeson
Purch Agr: C J Hathaway
WEBB MINE, Hibbing, underground & open pit
CRUSHING & SCREENING PL at Hibbing
4,100-ton per day WASH pl at Hibbing
Supt: J J Maney
SHENANGO MINE, Chisholm, underground & open pit
Supt: C O Rudstrom
Asst Supt: A E Erickson
Foreman: A Stukel
Engr: T J Barker
WHITESIDE MINE, Buhl, open pit, under dev
Supt: R M Baker
Engr: D C Swalm
WHITESIDE CRUSHING & SCREENING PL, Buhl

SOUTH AGNEW MINING CO
(See Northeast listing)
Operating subsidiary of M A Hanna Co, which see
c/o M A Hanna Co, Agents, Hibbing, Minn
Pres & Dir: A F Peterson
VP & Dir: Jos H Thompson
VP & Dir: H L Pierce
Sec: G W Humphrey
Ass't Sec: W M Driver
Asst Treas: S L Engel
Asst Sec & Treas: C W Gardner
Dir: P B Entrekin
Dir: John Nichols
SOUTH AGNEW MINE, Hibbing, Minn, Fe (See Butler Bros, feeholders)
Gen Mgr: R W Whitney
Asst Gen Mgr: E S Mollard
Purch Agt: G Shields
Supt: L M Bredvold
Asst Supt: R F Anderson
Foreman: A F Reisinger
SOUTH AGNEW CRUSHING & WASHING PL, 15,000 tons

STANLEY MINING CO
St Paul & Biwabik, Minn
Pres: Patrick Butler
VP: F S Bergstrom
Ch of Bd: Emmett Butler
Supt: H F Manseau, Biwabik
MARY ELLEN MINE, Biwabik, Mesabi Range, Minn, Open pit, Fe

U S GYPSUM CO
(See North Eastern listing)
ALABASTER, Mich, open pit, Gypsum

VAIL ENGINEERING CO
Box 59, Platteville, Wisc
Pres: A VAusterman
Sec Treas: Marjorie Webb
CHAMPION MINE, New Diggings, Wisc, underground, Zn, Pb
300-TON GRAV FLOT MILL
(Operating under lease to Benton Mlg Co)

VINECAR HILL ZINC CO
Platteville, Wisc
Gen Mgr: W N Smith
Works Acct: A W Heins
EAST BLACKSTONE MINE, Shullsburg, Wisc, 500 tons
HANCOCK MILL, flot, 800 tons monthly

WHITE PINE COPPER CO
(See Copper Range Co)
PROPERTIES IN Ontonagon Co, Mich, Cu, underground, dev

WYANDOTTE CHEM CORP
Wyandotte, Mich
SALT PLANT, Wyandotte

YOUNG, E A, INC
2223 First Ave, Hibbing, Minn
Pres: E A Young
VP & Supt: Nels Kempainen
Sec: D D Haley
MINNEWAS MINE, 2 mi E of Virginia, Mesabi Range, Minn, open pit & underground, Fe
Foreman: A N Heikkila
Assay: Lerch Bros, Inc

ZONTELLI BROS & LEACH
Ironton, Minn
VIRGINIA MINE, N of Ironton, Cuyuna Range, open pit, Fe

NORTH AND SOUTH CENTRAL

ARK, ILL, IND, IOWA, KANS, LA, MO, NEBR, N DAK, OKLA

A & H MINING CO
Box 306, Picher, Okla
MINES, Picher-Cardin area, Pb, Zn
Supt: John Henderson

ALCOA MINING CO
FLUORSPAR DIV, 1500 Mississippi Valley Trust Bldg, St Louis 1, Mo
VP in Chg: A B Williams
Works Mgr: W S Skeels
HUTSON MINE, Salem, Ky, Zn
FAIRVIEW MINE, Rosiclare, Ill, Pb, Zn
Fluorite, 5,000 tons monthly
Purch Agt: J K Chambers
Supt: W H Harrison
Engr: S G Bousman
Mech Engr: H E Efner
Geol: A H Sutton
HMS & FLOT MILL
Supt & Met: W C Lay
Assay: V C McDonald

ALLIED CHEM & DYE CORP
GENERAL CHEMICAL DIVISION
(See North Eastern listing)
MISSOURI CLAY FIELDS, Owensville
Supt: R A Parker

AMERICAN CYANAMID
30 Rockefeller Plaza, New York, N Y
BAUXITE MINE, Pulaki Co, Ark, Ilmenite

AMERICAN SMELTING & REFINING CO, (See North Eastern listing)
OMAHA SMELTER & REFINERY, Omaha, Nebr, Pb
Mgr: R C Skow
Supt: J C Reinhardt
FEDERAL SMELTER & REFINERY, Federal, Ill, Pb
Mgr: L J Buck
Supt: J H Vose
SAND SPRINGS PLANT, Sand Springs, Okla, Zinc dust
Supt: G E Weekly

AMERICAN ZINC CO of ILL
(See Texas listing)
Hillsboro, Ill
SMELTING & PROCESSING PL, Zn
Supt: H R Wampler
Met Div Supt: J F Clark
Gen Fore: H J Collett
Mech Engr: M A Bonadurer
Met: Oscar Hassell
Assay: Orville Rutledge
Annual prod:
12,800 tons Amer process zinc oxide
2,700 tons Fr process zinc oxide
7,150 tons slab zinc

AMERICAN ZINC, LEAD & SMELTING CO, NELLIE B DIV
Picher, Okla
Dist Mgr: J J Inman
BARBARA J, SKELTON, BUFFALO CALF, ADMIRALTY, BULL FROG & THOMAS BUFFALO MINES
Supt: O L Green
Mill Supt: T M Nix

ARKANSAS GYPSUM CO
Murfreesboro, Ark
Pres & Gen Mgr: Vernon B Lewis
GYPSUM MINE, Pike Co, Kans
GYPSUM MINE, Murfreesboro, underground, open pit, 3,000 tons monthly

ARKANSAS LIMESTONE CO
Cushman, Ark
MINE, Independence Co, Ark, Mn

B F & H MINES, INC
Box 105, Joplin, Missouri
Pres & Gen Mgr: H H Smith
VP & Mill Supt: W D Hughes
Sec Treas: Myra C Smith
BULL FROG MINE, Joplin, Mo, adit, Zn, Pb, 75 tons
75-TON GRAV MILL, Lone Elm, Joplin

BAILEY MINING CO
Box 525, Baxter Springs, Kans
MINE, Baxter Springs area, Pb, Zn
Supt: W L Barnett

BECK MINING CO
Box 408, Miami, Okla
Pres & Gen Mgr: G W Beck III
Sec Treas: Lottie E Harris
Geol: C E Stover
BECK #1 GRAV FLOT MILL, 1 mi E of Picher, Okla, 1200 tons, custom
BECK #3 GRAV FLOT MILL, 1 mi W of Baxter Springs, Kans, idle

BIG YANK MINING CO
Box 95, Picher, Okla
MINE, idle
Mgr: Ted Sherwood

BILHARZ MINING CO
Box 191, Baxter Springs, Kans
Pres: O W Bilharz
Sec Treas: A J Polette
MUNCIE MINE, Baxter Springs, Kans, Pb, Zn
Supt: R C Wells

BOB WHITE MINING CO
Box 677, Miami, Okla
CHUBB, CHEROKEE MINES, Blue Mound dist, Kans, Zn, Pb
Supt: Jack Osborne

BONANZA MINING CO
Box 505, Picher, Okla
MINE, Zn, Pb
Operator: Wilmer Ingram & Assoc

BUFFALO MINING CO
Box 241, Picher, Okla
MINES, Picher-Cardin area, Pb, Zn
Mgr: H L Childress

BURNS & TUCKER MINING CO
Box 366, Picher, Okla
MINE, Picher-Cardin area, Zn, Pb
Supt: O K Tucker

C K & E MINING CO
Joplin, Mo
C K & E MINE, Blue Mound-Baxter Springs dist, Zn, Pb, 25,000 tons yr
Supt: G L Childress

C & M MINING CO
Box 299, Baxter Springs, Kans
MINE, Baxter Springs area, rm-pillar stopes, Zn, Pb, 3,000 tons
Supt: H G Milligan

CARDINAL MINING CO
215 E 9th St, Picher, Okla
MINES, Picher-Cardin area, Zn, Pb
Supt: C A Baker

CARPENTER MINING CO
Picher, Okla
Pres: Ella T Carpenter
NEW YORK & OKO MINES, Picher-Cardin area, Pb, Zn, idle

CARTER MNG & MLG CO
Mineral Point, Mo
125-TON BARITE MILL, Mineral Point
(Joint operator: Superior Mining Co)

CERTAIN-TEED PROD CORP
(See North Eastern Listing)
Box 187, Blue Rapids, Kans
MINES, Blue Rapids, underground, Gypsum

CONNER INVESTMENT CO
329 Joplin St, Joplin, Mo
Sec: G A Wadleigh
MINES, Joplin dist, Zn, Pb (Leased)

CONTACT MINING CO
Box 849, Miami
MGR: Vernon Sapp

CORONADO MINES INC
208 Wright Building, Tulsa, Okla
Pres: Milton Leon
VP: S P Bowyer
Sec Treas: A F Bourne
(See Arizona listing for mines)

CRAIG MINING CO
212 Engineers Bldg, Joplin, Mo
Mgr: F F Craig, contract mining

CROUCH MINING CO, INC
(See South Eastern listing), Subsidiary of General Abrasive Co, Inc, Niagara Falls, New York
Box 117, Bauxite, Ark
Gen Mgr: L M Richard
CROUCH MINE, RFD 1, Bauxite, Ark, underground & open pit, Bauxite
200-TON Calcining Kiln, Corundum
Supt: Charles Van Ness
Met: Anne Redden

CRYSTAL FLUORSPAR CO
Box 183, Elizabethtown, Ill
Pres: G H Kaegy
Asst Sec: M F Steffenson
Gen Mgr: D G Gibson
Purch Agt: E E Glenn
CRYSTAL MINE, 9 mi NE of Elizabethtown, open stopes, 100 tons, Fluorspar
180-TON HEAVY MEDIA MILL, at mine
Mine & Mill Supt: I V Robertson
Mine Foreman: Harve Partain
Mine Engr: D B Holbrook
Mill Foreman: F U Austin

DALE MINING CO
811 Kentland, Neosha, Mo
Partners: D P & G E Klepinger, J A Worley

DALE MINE, Stark City & Aroma, Mo, shaft, Pb, Zn, 400 tons
Foreman: Boyd Mitchell
Engr: F E Griffiths
400-TON GRAV FLOT MILL
Foreman: Frank Crabb

DINES MINING CO
Baxter Springs, Kans
BLUE MOUND GRAV FLOT MILL, Zn, Pb
Supt: H G Weidman
Prod: 30,000 tons yearly

DRYER MINING CO
Commerce, Okla
SOUTH SIDE MINE, 2 mi E of Commerce, Pb, Zn
Mgr: Jake Dryer

DULIN BAUXITE CO
Sweet Home, Ark
MINE, Pulaske Co, Bauxite

DUNCAN MINING CO
212 Choteau Ave, Baxter Springs, Kans
Owner: G W Duncan
MINE, Baxter Springs area, Pb, Zn

EAGLE PICHER CO, MINING & SMELTING DIVISION
First Nat'l Bank Bldg, Miami, Okla
Pres: T Spencer Shore
VP & Gen Mgr: Elmer Isern
Compt: G H Walbert
Dir of Mines: J W Chandler
Dir of Mills: E H Crabtree Jr
Dir of Pers: E C Mabon
Dir of Insurance: K E Kimmel
MINES, Tri-State Area, Zn, Pb
Office Address: Cardin, Okla
Gen Mgr: H W Harrison
Gen Supt: S S Clarke
Mill Supt: Fred Phelps
KANSAS: Big John, Leopard, Webber, Westside #2, Foley #3 & Wilbur
OKLA: Wilson, Blue Goose, Buffalo, Goodeagle #3, Gordon, Grace Walker, John Beaver, Lottson, Piokee, Slim Jim, See Sah & Southside #2
CENTRAL GRAV FLOT MILL, Cardin
ZINC SMELTER, Henryetta, Okla
Mgr: F G McCutcheon
GRAHAM CENTRAL MINE & MILL, Galena, Ill, Zn, Pb
Mgr: Claude O Dale

EVANS, F W
Evans Bldg, Joplin, Mo
Owner: F W Evans
LUCKY O K, Hockerville

F & G MINING CO
Box 478, Baxter Springs, Kans
Gen Mgr: E M Fournier
KANSAS LINE MINE, Pb, Zn
Supt: W F Houston
Engr: I R Schloe

FEDERAL MNG & SMLTNG CO
(See North Eastern listing)
CENTRAL DIVISION, Baxter Springs, Kans
Gen Supt: W C Ball
GORDON MINE, Oklahoma, Pb, Zn
DUNENWEG MINE, Missouri, Pb, Zn

FRANK HUDSON MINING CO
Rt 2, Miami, Oxalhoma
CRAIG LEASE, Picher-Cardin area, Pb

GOOD ENUF MNG & MLG CO
Box 631, Joplin, Mo
Mgr: G L Rutledge
GOODENUF MINE, Lawrence Co, Mo, Zn

GRACE JARRETT MINING CO
Box 73, Picher, Okla
Mgr: W A Childress
FEDERAL-JARRETT MINE, Kansas

GRAY WOLF MINING CO
318 N Gladys, Picher, Okla
GRAY WOLF MINE, SW of Picher, Zn, Pb
Mgr & Purch Agt: C G Frisbie
Foreman: R L Frisbie
Idle

HARRELD & MARTIN
Galena, Kans
WYLAND LAND MINE, Galena dist, Zn, Pb

HARRIS MINING CO, INC
440 E 12th St, Baxter Springs, Kans
Pres & Gen Mgr: Loren Keenan
VP & Supt: A T Harris
Sec Treas: Robert Nichols
GOLDEN ROD, FARMINGTON & LUCKY JENNY MINES, 5 mi SW of Baxter Spngs, shaft, Zn, Pb, 450 tons
Mech Engr: Burl Smith
600-TON GRAV FLOT MILL, Hockerville, Okla
Supt: Lymond Smith

HECKENBOTTOM & McCURRY
Harrison, Ark
NORTH ARKANSAS MINE, Zn

HECKS CR FLUORSPAR MNG CO
Elizabethtown, Ill
DOUGLAS MINE, Pope Co, Ill, Fluorspar

HEDGES & HEVER
Compton, Ark
BREWER MNS, near Compton, Pb

HEGLER ZINC CO
Danville, Ill
DANVILLE SMELTER, Zn

HELEN H MINING CO
Box 326, Baxter Springs, Kans
MINES, Baxter Springs, Kans & Picher-Cardin, Okla areas, Zn, Pb
Mgr: Claude Jones

HUGHES, W A & SON
1801 S Oronogo St, Webb City, Mo
Gen Mgr: W A Hughes
MINE, Pb, Zn
20-TON FLOT MILL

INDEPENDENT GRAVEL CO
2201 W 4th Ave, Joplin Mo
Pres: W R Snapp
VP & Sec: E C Toutz
VP & Gen Mgr: R D Toutz
ICE PLANT MINE, Webb City, Mo, Zn
Supt: R R Davis
Prod: 100 tons yearly
MILL, N of Webb City
Supt: L Cruzan

INLAND STEEL CO
38 S Dearborn St, Chicago 3, Ill
Pres: Clarence B Randall
VP, Chg Raw Mat Dept: C B Jacobs
(See Lake Superior listing)

INTERNAT'L MIN & CHEM CORP
20 N Wacker Dr, Chicago 6, Ill
Pres: Louis Ware
Exec VP: J P Margeson Jr
VPs: M H Lockwood, Franklin Farley, A N Into, F D V Manning, J R Bishop
VP & Treas: R P Resch
Corp Sec: E D McDougal Jr
Ch Engr: T M Ware
(See Mont & N Mex listings)

KEITH & YORK
c/o St Louis Mng & Mlg Corp, Box 508, Joplin, Mo
MINE, N of Joplin, open pit, Zn

LINDA LOU MINING CO
Box 91, Miami, Okla
Mgr: Al White

LITTLE BEN MINING CO
Box 229, Baxter Springs, Kans
Mgr: H G Milligan

LIZA JANE MNG CO, INC
Box 343, Baxter Springs, Kans
Pres & Gen Mgr: R W Love
VP & Gen Supt: W O Shoemaker
LIZA JANE MINE, 1 mi W of Baxter Springs, underground, Zn, Pb
Prod: 75 tons

MacARTHUR MINING CO
Box 356, Baxter Springs, Kans
Pres & Gen Mgr: J W Hoffman
MacARTHUR MINE, 4 mi W of Baxter Springs, Pb, Zn
Supt: A E Campbell
Engr: Roy Campbell

MAGNET COVE BARIUM CORP
Malvern, Ark
MINE, Hot Springs Co, Ba

MAHUTSKA MINING CO
Box 241, Picher Okla
MINE, Picher-Cardin area, Zn, Pb

MARK TWAIN MINING CO
Box 241, Picher, Okla
Mgr: W L Childress
BLUE MOUND MINE, Kansas
AZTEC MINE, Picher-Cardin area, Okla, Zn, Pb

MASON, ROBERT
Baxter Springs, Kans
BREWSTER MINE, Blue Mound dist, Pb, Zn

MATTHIESSEN & HEGELER ZINC
LaSalle, Ill
LaSALLE WORKS, LaSalle, Zn

MID-CENTURY MINING CO
Box 308, Picher, Okla
Owner: John Henderson
MINES, Picher-Cardin area, Zn, Pb

MIDWEST MNG & MLG CO
Fredericktown, Mo
Pres: Henry Cross
VP & Gen Mgr: E L Petly
Purch Agt: C H Slaney

CATHERINE & FLEMING MINES, underground, Pb, 75 tons
Supt: J W Huffman
GRAV FLOT MILL
Supt: Floyd Rogers

MINERVA OIL CO, Mining Division
Myers Bldg, Eldorado, Ill
Pres: J Desloge
Gen Mgr: J H Steinmesch
Sec: Berkley Jones
Purch Agt: S J Kelly
MINE #1, Rt 2, Cave-in-Rock, Ill, Zn, Fluorspar, 300 tons
Gen Supt: Gill Montgomery
Foreman: C F Callahan
Asst Foreman: Joe Doggett
Power Foreman: Cy McConnell
Ch Elec: George Jenkins
Geol: C W Shaw
Yd Fore: Claud Scott
Ch Mech: U P Douglas
Mech Engr: W J Young
300-TON FLOT MILL
Supt: O E Anderson
Assay: C B Rash
Met: D C Spees

MILLER, J E
Oak Park, Ill
MERRIT & WALLIS PROPERTIES, Dubuque Co, Iowa, Pb, Zn, dev

MISSION MINING CO
Box 408, Miami, Okla
Supt: R H Beck
CUSTOM MILL & MINE near Quapaw, Okla, Pb, Zn

NATIONAL GYPSUM CO
(See North Eastern listing)
MINE & PLANT, Medicine Lodge, Kans, underground, Gypsum
Pl Mgr: D C Chads
Mine Supt: S J Shepler
QUARRY & PLANT, Fort Dodge, Iowa, Gypsum
Pl Mgr: H J Marsham
Quarry Supt: J C Pitts

NATIONAL LEAD CO
(See North Eastern listing)
BARROD SALES DIV (See Texas listing)
MAGNET COVE PL, Malvern, Ark, barite, open pit
GRAV & CHEM MILL
Supt: E H Murchison
FOUNTAIN FARM Potosi Mo, barite, open pit
GRAV MILL
Supt: W A Halbert
ST LOUIS SMELTING & REFINING DIV
Mgr: Jean McCallum
MADISON MINES, Fredericktown, Mo Pb, Cu
Purch Agt: W M Lowry
Supt: A J Yahn
800-TON FLOT MILL
TRI-STATE MINES, Baxter Springs, Kans
Supt: H A Krueger

NORTON CO
(See North Eastern listing)
BAUXITE MINE, Bauxite, Ark

OZARK MAHONING CO
Box 449, Tulsa 1, Okla
Pres & Gen Mgr: Park Kelley
(See Texas & N Mex listings)

OZARK ORE CO
Subsidiary of M A Hanna Co, (See Lake Superior listing)
1300 Leader Bldg, Cleveland 14, O
Pres: J H Thompson
Exec VP: H L Pierce
VPs: P G Harrison, G W Humphrey
Sec: L W Spang
Asst Sec & Treas: C W Gardner
Asst Treas: S L Engel
Gen Mgr: R C Fish
IRON MT MINE, Iron Mt, Mo, underground, open pit, Fe
Supt: W F Shinners
GRAV MILL
Supt: A E Cameron

PELICAN MINING CO
Box 408, Miami, Okla
PELICAN MINE, Picher-Cardin area, Pb, Zn
Mgr: D S Sims

POTTER SIMS MINES INC
Box 295, Joplin, Mo
JASPER & SNAPP MINES, Jasper Co, Zn, Pb
SUCKER FLAT & SNAPP MILLS

PRAIRIE DOG MINING CO
Box 323, Miami, Okla
MINE, Commerce area, Pb, Zn

PRIMROSE, HARRY
Ponca, Ark
PRIMROSE MINE, Newton Co, Zn, Pb, idle

RESIDUE MINING CO
Box 95, Picher, Okla
MINE, Picher-Cardin area, Pb, Zn
Mgr: Boliver Green

REYNOLDS MINING CORP
Rt 2, Box 156, Alexander, Ark
Pres: Walter L Rice
VP & Geol: O C Schmedeman
VP & Mines Mgr: R H Zeglin
Purch Agt: J W Glover
BAUXITE MINES, Pulaski Co, Ark
Surface Supt: A F Peterson
Underground Supt: G M Wagner
Ch Engr: H T Middlebrook

RICHEY, GLEN, MNG CO
Webb City, Mo
GRASSELLI OPERATIONS, Waco dist, Zn

ROANOKE MINING CO
Box 366, Picher, Okla
Mgr: W A Brewer
HOMESTAKE MINE, Blue Mound dist, Zn

ROARK, J M CONST CO
Anderson, Mo
Pres: Tim Roark
VP & Gen Mgr: Jim Roark
ROARK MINE, 5 mi from Joplin, Mo, Pb, Zn
Supt: Claude Roark
300-TON FLOT MILL, Chitwood, Mo

ST JOSEPH LEAD CO
(See North Eastern listing)
BONNE TERRE, DESLOGE, FEDERAL, & LEADWOOD MINES & MILLS, in SE Missouri, Pb
28,000-TON mill equipment
Prod: 7,000,000 tons annually, ore & reclaimed tailings
LEAD SMELTER, Herculaneum, Mo
Prod: 100,000 tons annually

ST LOUIS MNG & MLG CORP
Box 508, Joplin, Mo
Pres: E R Meissner
Sec: D B Meissner, Jr
Purch & Local Mgr: C H Isaacs
MINE & CUSTOM MILL, 6 mi NW of Joplin, Zn, Pb
Fore: C O Smith

ST REGIS MINING CO
Box 752, Duenweg, Mo
MINE, Duenweg, Missouri area
Supt: Harold Fenix

SEMPLE, C Y
Baxter Springs, Kans
3,000-TON GRAV FLOT MILL
BALLARD MINE, open pit
MINE, Cherokee Co, Kans
Supt: E N Smith
Mech Engr: Roy Pigg

SIMMS, C C
Cushman, Ark
MINE, Independence Co, Ark, Mn

SOONER MILLING CO, INC
Box 385, Picher Okla
Pres & Gen Mgr: L R Hill
VP & Mill Supt: John Norman
Sec Treas: H O Gray
SOONER TAILING MILL, 1 mi NE of Picher, Okla, Zn, Pb, 100 tons/hr
Mast Mech: O E Hatfield
GRAV FLOT MILL, 3,500 tons, Zn, S

STANDARD MINING CO
151 W Main St, Batesville, Ark
Mgr: Lester Samuels
MINE, Independence Co, Mn

SUPERIOR MINING CO
Potosi, Mo
125-TON BARITE MILL, Mineral Point (Joint operator: J E Carter M & M Co)

TIGER MINING CO
Box 366, Picher, Okla
KANSAS-FOX LEASE, Blue Mound, Kansas area
Supt: W A Brewer

TONGAHA MINING CO
Box 366, Picher, Okla
Pres: W A Brewer
Gen Mgr: O K Tucker
TONGAHA MINE, Picher-Cardin area, Zn, Pb
Supt: Fred Poor

TRI-STATE ZINC INC
(See North Eastern listing)
Box 1011, Galena, Ill
Gen Mgr: M H Loveman
Asst Mgr: V C Allen
GRAY BAUTSCH & HEER MINES, Galena, Ill, Pb, Zn
900-TON FRAV FLOT MILL
Prod: 750 tons

U S GYPSUM CO
300 W Adams, Chicago 6, Ill
Ch of Bd: C H Shaver
Pres: O M Knode
VPs: H F Sadler, Edward Rembert, J H Noid, E W Carey
Sec & Asst Treas: A W Irwin
Asst Secs: N A Lang, L W Austin
Asst Treas: G W Clarke
Ch Engr, Mines: J F Harvard

FORT DODGE, Iowa, Gypsum
(See California & Tex listings)

U S LEAD REFINERY, INC
(Subsidiary of U S Smelting, Refining & Mining Co, see under Utah listing)
East Chicago, Ind
EAST CHICAGO PL, East Chicago, Pb

VICTOR CHEMICAL WORKS
141 W Jackson Elvd, Chicago 4, Ill
Pres: Rothe Weigel
(Operations in Calif, Ill, Fla, Mont, Penn, Tenn, which see)

W M & W MINING CO
Box 326, Baxter Springs, Kans
Pres: W J Worley
Gen Mgr: E G Mattison
VELIE MINE, Cardin Okla, Pb, Zn
HUTTIG-BREWSTER MINE, in Kans

WADE REA MINING CO
Galena, Kans
WADE HUNTER MINE, Quapaw area, Pb, Zn
Mgr: Otis Wade
GRAV FLOT MILL, Zn

WESTMORELAND MANGANESE
Batesville, Ark
Gen Supt: H E McBride
MINE, Independence Co, Mn

SOUTH EASTERN

ALA, FLA, GA, KY, MD, MISS
N C, S C, TENN, VA

ALABAMA FLAKE GRAPHITE
420 Comer Bldg, Birmingham, Ala
Pres: W L Shumate, Jr
VP: H E Haworth
VP & Gen Mgr: W L Moore
Sec: A L Crumpton
Met: L B Adams
Geol: L H Williams
POCAHONTAS MINE, Ashland, Ala, graphite, open pit
POCAHONTAS MILL, 200-ton flot

ALCOA MINING CO
(See North & South Central listing)
HUDSON MINE, Salem, Ky, Zn

ALLIED CHEM & DYE CORP
GENERAL CHEMICAL DIVISION
(See North Eastern listing)
GOSSAN MINES, Galax, Va, Pyrrhotite
Supt: Fred Johnson

AMERICAN COLLOID CO
Merchandise Mart Plaza, Chicago 54, Ill
Pres: Paul Bechtner
VP: W D Weaver
Purch Agt: Roy H Harris
PANTHER CREEK MINE, 20 to 35 mi W of Aberdeen, Miss, Placer, Bentonite
MILL, 30,000 tons yearly
Mine & Mill Supt: Claud Acord
Ch Chem: A G Clem

AMERICAN AGRI CHEM CO
(See North Eastern listing)
PEBBLE Phosphate Rock, Pierce, Fla

AMERICAN CYANAMID
(See North Eastern listing)
SADDLE CR MINE, Brewster, Fla, open pit, Phosphate rock
3,000-TON GRAV FLOT MILL
SYDNEY MINE, Brewster, Fla open pit, Phosphate rock
1,800-TON HMS MILL
Mgr: Arthur Crago
CALCO CHEM DIV, Piney River, Va
Gen Mgr: W J Cauwenberg
Gen Supt: C J Kirkland
Prod Supt: C E Craven
Purch Agt: C V Holshouser
PINEY RIVER MINE, Piney River, Ilmenite, 400 tons
Supt: S V Wilkins
PINEY RIVER MILL, 400-ton flot

AMERICAN ZINC CO of TENN
Mascot, Tenn
Pres: H I Young
Gen Supt: H A Coy
Asst Gen Supt: William Black
Purch Agt: C C Sisk
MASCOT # 2 MINE, Mascot, Zn
GRASSELLI MINE, New Market, Tenn, Zn
JARNAGIN & ATHLETIC MINES, Jefferson City, Tenn, Zn
Supt: M J Langley
Engr: W H Johnson
Mech & Elec Engr: I C Mitchell
Safety Engr: Harold Thompson
Ch Geol: C R L Oder
FLOT, HMS, JIG MILLS
Supt: D B Grove
Asst Supt: R B Brackin
Met: Jim Folhemus
Assay: D L Chadwick
Prod: 3,800 tons

APPALACHIAN ZINC CO
Embreville, Tenn
Pres: G R Warren
MINE, Pb, Zn, idle

ARMOUR FERTILIZER WORKS
Columbia, Tenn
Supt: W B King
Phosphate rock

ARRINGTON MINING CO
Cedartown, Ga, Fe
Pres: C B Arrington

BARTOW MINING CO
Cartersville, Ga Fe
Owner: George Shropshire

BEE TREE VERMICULITE MNS
Tigerville, S C

BLUE RIDGE TALC CO
Box 7, Henry, Va
Pres: E D Gregory
VP & Gen Mgr: C O Kitson
Sec: J C Looney
Supt: R K Kitson
KING-RAMSEY MINE, Henry, soapstone
Foreman: Roy Cannady
KING-RAMSEY MILL, 45-ton prod

BOYD MINE
(See Tennessee Copper Co)

BRADLEY ESTATES, INC
Floral City, Florida
Soft Phosphate or Colloidal Clay

BUTLER & MOODIE
Salem, Ky
KLONDYKE TAILING MILL, Salem
Fluorspar

C & L FLUORSPAR CO
Marion Ky

CAROLINA MINERALS CO, INC
Box 415, Bedford, Va
HARRIS #2, WATSON, JOHNSON & SCOT, & COX MINES, Bedford & Piney River, Va, feldspar, mica & quartz

CHILDERSBURG ORE CO
Childersburg, Ala
Pres: Robert Russell
VP: C N Owings
CHILDERSBURG MINES, open cut & power shovel, Talladega co, Fe

CLINCHFIELD SAND & FELDSPAR
618 Mercantile Trust Bldg, Baltimore 2, Md
MINES, Mariotsville, Md & Kings Creek, S C, talc & soapstone

COLLOIDAL PHOSPHATE SALES
Box 1588, Tampa 1, Fla
Pres: Chris Fagg
VP: E P Fagg
Sec Treas & Gen Mgr: G T Dyer
MINE, 1 mi E of Dunnellon, Fla, surface, Colloidal Phosphate
HAMMER MILL

COMMERCIALORES CO
Clover, S C
Pres & Mgr: A R Eckel
MINE, Clover, Kyanite

CONS HIGH GRADE ORE CO
Box 532, Cleveland, Tenn
Partners: G S, I B & J D Murray
HAMBRIGHT MINE, Dalton Pike, Tenn, Mn, Fe, hydraulic placer
Supt: Tom Duckett
Prod: 30 tons Fe, 10 tons Mn
HAMBRIGHT MILL, 50 tons, grav

CONYER, L
Marion, Ky
CONYER MILL, Salem, Ky, Fluorspar

CORONET PHOSPHATE CO
Plant City, Fla
Land Pebble Phosphate

CRIDER & CRIDER
Marion, Ky
Owner: Hobart Crider
REITER MINE, Mexico, Ky, Fluorspar

CRIDER BROS FLUORSPAR CO
Mexico, Ky
Partners: J W & W H Crider
Gen Mgr: B M Travis
MARBLE MINE, 6 mi NE of Fredonia, Ky, underground, Fluorspar
GRAV FLOT MILL

CROUCH MINING CO, INC
(See General Abrasive Co, Inc)

DAVISON CHEMICAL CORP
Davidson Chem Bldg, Fayette & Charles St, Baltimore 1, Md
Pres: C F Hockley
VP: G M Hebbard
PHOSPHATE ROCK DIV, Box 471, Bartow, Fla
Div Mgr: A T Cole
Purch Agt: C A Pierce
Supt of Oper: J M Harris
Mgr Prod Plan: J L Hunter
Maint Supt: E J Purcell
Procedure Engr: E L Chapman
Ch Engr: J W Pamplin
Ch Chem: C D McDowall
Elec: W H Hallman
Safety Engr: J R Terry
PAUWAY #4 MINE, Bartow, phosphate, open pit
Supt: B P Jones
BONNY LAKE MINE, Bartow, phosphate, open pit
Supt: E S Beebe
2,000-TON FLOT MILL, Ridgewood
Supt: C B Blood

DOMINION MANGANESE CORP
(See North Eastern listing)
OLD DOMINION MINE, Wainsboro, Va, Mn

ELECTRO MANGANESE CORP
Knoxville, Tenn
Pres & Gen Mgr: E M Wanamaker
REFINERY, Electrolytic Mn metal

EUTAW DEV CO
Cartersville, Ga, Fe
Mgr: H Styskal

FARMER CONSTRUCTION CO
Columbia, Tenn
Supt: J G Farmer, Sr
Phosphate mining

FEDERAL CHEMICAL CO
Mt Pleasant, Tenn
Mgr: D S Miller
Washed & Dried Raw Phosphate Rock

FLORIDA ORE PROCESSING CO
Box 417, Melbourne, Fla
Ilmenite, Rutile, Zircon, Garnet, Monazite

GAMMAGE MINING CO
Cedartown, Ga, Fe

GENERAL ABRASIVE CO, INC
(See North Eastern listing)
CONISOONA MINE, 3 mi from Kingston, Ga, Bauxite, dev
Supt: Chas Van Ness
50-TON MILL
Supt: Warren Redden
CROUCH MNG CO, INC, (subsidiary)
CROUCH MINE, Bauxite, Ark, bauxite

GLADE MOUNTAIN CORP
Box 230, Marion, Ky
Pres: N T Dixon
GLADE MT MINE, Mn

GLASS FLUORSPAR CO, INC
Princeton, Ky
Pres: C B Meadows
SENATOR & MEADOWS MINES, Princeton, fluorspar, underground

GLIDDEN COMPANY
Lenoir, N C
MINE, Lenoir, Ilmenite
PLANT, Baltimore, Md

HARSH PHOSPHATE CO
Nashville, Tenn
Mgr: M G Harsh
Raw ground phosphate rock

HARTFORD TALC & QUARTZ CO
Bel Air, Md
MINE, Daublin Md, talc & soapstone

HIGHLAND MINING CORP
Centerville, Tenn
Pres: Bill Davis
Ground phosphate

HODGE MINING CO
Box 369, Cartsville, Ga
Owner: J W Hodge
Sec: M T Shaw
HODGE MINE, 14 mi W of Cartersville, Ga, Fe, 575 tons
Supt: Clyde Shaw
MINE, Bartow Co, open pit, Fe

HOWARD PHOSPHATE CO
Box 3028, Orlando, Fla
Gen Mgr: R M Howard
MINE, Inverness, Fla, open pit, 200 ton bucket dredge, soft, colloidal & hard phosphate
Mine & Mill Supt: W E Marlow

HUMPHREYS GOLD CORP
1st Nat'l Bank Bldg, Denver 2, Colo
SUCTION PLACER MINE, near Jacksonville, Fla, Ilmenite, Rutile, Monazite (Leased by Rutile Mining Co, See N E)
SUCTION PLACER MINE, near Starke, Fla, Ilmenite & Zircon
(Leased by E I Dupont de Nemours & Co, see N E listing)

INDUSTRIAL MINERALS INC
York, S C
Pres & Gen Mgr: L G Wilson
VP & Sec: W F Wilson
KINGS CR MINE, 14 mi W of York, barite, underground, open pit, 15 tons
KINGS CR MILL, 45-ton, crush & grind

INLAND STEEL CO
(See North & South Central listing)
KEYSTONE & BARNES MINES, Crittenden Co, Ky, Fluorspar
QUILL MINE, Livingston Co, Ky, Fluorspar

INTERNAT'L MIN & CHEM CORP
(See New Mexico listing)
PHOSPHATE MINES, Fla & Tenn

K T DOME MNG SYNDICATE INC
Gratz, Ky
GRATZ MINE, Owen Co, Ky, Pb

KELLOGG CO
920 Franklin St, Ocala, Fla
Soft Phosphate or Colloidal Clay

KENTUCKY FLUORSPAR CO
Marion, Ky
MINE, Marion, fluorspar

KIBLER-CAMP PHOSPHATE
Ocala, Fla
Gen Mgr: D B Kibler Jr
SECTION 12 MINE, Dunnelion, Fla open pit, hard rock phosphate
Supt: T D Felton
Asst Supt: N T Farrell
Prod: 6,000 tons monthly

LONCALA PHOSPHATE CO
Box 338, High Springs, Fla
Soft Phosphate with Colloidal Caly

MATTHIESSEN & HEGELER ZINC
(See North & South Central listing)
MEADOWBROOK PLANT, Spelter, W Va, Zn

MINERAL MINING CORP
Kershaw, S C
Pres & Mgr: F C Bingham
MINE near Kershaw, Sericite & Mineralite

MINERAL PRODUCTS CORP
Box 117, Rockford, Ala
Pres: C A Dean
VP: Robert Russell
Sec: Mrs H C Holf
Prospects near Mitchell Dam, Coosa Co
Graphite
PILOT MILL near Rockford

MONSANTO CHEMICAL CO
1700 S Second St, St Louis, Mo
Pres: W M Rand
VP: C A Thomas
MINE, 8 mi SW of Columbia, Tenn, open pit, dragline excav, Phosphate
Gen Mgr, Phos Div: J L Christian
Purch Agt: E L Sanderlin
Pl Mgr: E J Bock
Mine Supt: H A Webster
Asst Supt: E W Miles
Engr: R B Shaffer
Mech Engr: W C Robbins
Elec Engr: R L Van Fossen
Safety Engr: A N Allen
GRAV MILL
ELECTRIC FURN, 25,000-kw, yellow, phosphorus

NEW JERSEY ZINC CO
(See North Eastern listing)
BERTHA MINERAL DIV
MINE, Austinville, Va, Zn, Pb
2000-TON FLOT MILL
Supt: W L Albers

NATIONAL GYPSUM CO
(See North Eastern listing)
MINE & PLANT, Kimballton, Va, limestone, underground,
Pl Mgr: Monroe Rule
Mine Supt: James Huffman

OWENS AG PHOSPHATE CORP
Centerville, Tenn
Ground Phosphate Rock

PENNSYLVANIA SALT MFG CO
(See North Eastern listing)
KENTUCKY-BABB MINE, Salem, Ky, fluorspar

PRAIRIE STATE PHOSPHATE CO
Centervile, Tenn
Ground Phosphate Rock

REPUBLIC MINING CO (Alcoa)
Eufaula, Ala
MINERS & SHIPPERS of Bauxite
Mgr: Earl Wilson

REPUBLIC STEEL CORP
(See Lake Superior listing)

EDWARDS MINE, Birmingham, Ala, underground, Fe, 500,000 tons yr
Mgr: B H McCrackin
Supt: B C Jones
Elec Engr: J Donohue
Ch Engr: R B Watt
Maint Engr: E Read
SPAULDING MINE, Birmingham, Ala, underground, open pit, Fe
Acting Supt: A F Hellecke
Ch Engr: R B Watt
Elec Engr: W J Donohue
Prod: 400,000 tons yearly, 250,000 tons yearly from grav conc

RIVER & RAIL PHOSPHATE CO
135 2nd Ave North, Nashville, Tenn
Pres & Gen Mgr: L H Jordan
Sec: S E Wheeler
Gen Supt: Claude Warren
MINE 6 mi NW of Nashville, Tenn, open pit, dragline, raw Phosphates
Fore: Geo Prince
PLANT, Jordonia, Tenn

RUHM PHOSPHATE & CHEM
Columbia, Tenn
Pres: O M Babcock Jr
MINE, Mt Pleasant, open pit, phosphate rock
600-TON GRAV MILL

RUTILE MNG CO of FLORIDA
111 Broadway, New York 6, N Y
MINE, S Jacksonville, Fla, open pit
(Leased from Humphreys Gold Corp)

SCHROETER MINING CO
Russellville, Ala
MINE, HMS MILL, Franklin Co, Fe

SEA BOARD PHOSPHATE CO
Dunnellon, Fla
Soft phosphate or colloidal clay

SHOOK & FLETCHER SUPPLY CO
1814 1st Ave, Birmingham, Ala
Miners & Shippers of brown iron ores
Gen Supt of Mines: A M Shook III

SLOSS-SHEFFIELD STEEL & IRON
Birmingham, Ala
Pres: C S Lawson
VP: Wm Neal
Purch Agt: H E Cross
Gen Supt: T E Costner
LaGRANGE & RUSSELLVILLE MINES # 5 & 12, open pit, Fe
RUSSELLVILLE #14 MINE, 2 mi E of Russellville, Ala, open pit, dragline, Fe
Supt: S A Britton
Asst Supt: Roy Shirley
Fore: Hobart Norton
Engr: R M Tate
Geol: Jack Morris
HMS MILL
Supt: S A Britton
Met: Paul Wallcott

SOIL BUILDERS, INC
Dunnellon, Fla
Soft phosphate or colloidal clay

SOUTHERN MICA CO
Johnson City, Tenn
Pres: Mrs D B Rice
VP & Gen Mgr: C B Rice
Sec: Martha McClain
SOUTHERN MICA MINE, 5 mi from Burnsville, N C, open pit, Mica
Supt: G W Edge
SOUTHERN MICA MILL, 35-ton
Supt: J F Reynolds

SUPERIOR PHOSPHATE CO
Box 476, Dunnellon, Fla
Soft phosphate & collodial clay

SWIFT & CO
U S Yards, Chicago Ill
Pebble phosphate, Bartow, Fla

TENN COAL & IRON DIV, U S STEEL CO, Fairfield, Ala
Pres: A V Wiebel
Exec VP: John Fugsley
VP, Oper: J M Spearman
Mgr, Raw Mat: R E Kirk
Asst Mgr, Raw Mat: E P Reed
IRON MINES & FURNS Near Fairfield & Bessemer, Ala
Res Engr: E H Rose
Gen Supt: A W Beck Jr
Supt, Ishkooda Div: P J Zukow
Supt, Muscoda Div: G M Neal
Supt: Wenonah Div: J G Creveling
Supt, Dolonah Quarry: G B Neal
Supt, Ore Pl: C B Cameron
ZINC MINES, Jefferson City, Tenn
Gen Supt: E B Hennings

TENNESSEE COPPER CO
61 Broadway, New York 6, N Y
Pres: E H Westlake
VP & Gen Mgr: T A Mitchell
BURRA BURRA, EUREKA, BOYD, CALLOWAY & MARY MINES, Copperhill, Tenn
Au, Ag, Cu, Zn, Fe
Prod Mgr: C H McNaughton
Supt: L Weaver
1,000-TON FLOT MILL
Supt: J F Myers
Prod: 1,000,000 tons yearly

TENN VALLEY AUTHORITY
Knoxville, Tenn
AKIN MINE, Box 73, Columbia, Tenn, open pit, dragline, Phosphate
GRAV OPERATION, 400,000 tons yearly

THOMPSON-WEINMAN CO
Cartersville, Ga, barite

TONCRAE MINING CO, INC
2811 Greenlawn Ave, Wmsn Rd, Roanoke, Va
Pres & Gen Mgr: C H Thompson
VP: W J Durkin
Sec: Leo Howard
Purch Agt: C H Thompson
TONCRAE #1 MINE, Rt 6, Floyd, Va, Cu, Fe
Supt: HC Harmon
Asst Supt: Robert Conner
Fore: Oscola Pratt
ROASTING, LEACH & PRECIP PL
Prod: 60 tons

TUNGSTEN MINING CORP
(See North Eastern listing)
HAMME MINE, 16 mi NW of Henderson, N C, underground, WO_3, 300 tons
Supt: J C O'Donnell
Fore: E H Roberts
Engr: R M Richmond
Mast Mech: S F Edwards
350-TON GRAV FLOT MILL
Supt: J V Hamme
Fore: Lee Angel
Chem: W H Furman

U S GYPSUM CO
(See Calif listing)
Plasterco, Va
Gen Mgr: H D Decker
NUMBER 6 MINE, Plasterco, Gypsum
Supt: R C McNamee
Foreman: D R Davis

U S STEEL CO
(See North Eastern listing)
TABB #1 MINE, Mexico Ky, Pb, Zn, F
Purch Agt: C G Strote
Supt: K A Johnston
Asst Supt: J R Drenan
Engr: W T Folwell
Fore: Dixie Martin, J G Martin
Elec: Clarence Agee
150-TON GRAV FLOT MILL
Fore: P N Buckalew
Met: J W Hina

UNIVERSAL EXPLOR CO
Birmingham, Ala
Pres: A V Weibel
Gen Supt: E B Jennings
MINE, Jefferson City, Tenn, Zn
300,000-TON FLOT MILL

VICTOR CHEMICAL WORKS
(See North Central & Mont listings)
Tarpon Springs, Fla
Elemental Phosphate Plant

VIRGINIA-CAROLINA CHEM CORP
Box 1797, Richmond 14, Va
Pres: J A Howell
VP: C E Heinrichs
TENN MNG DEPT, Mt Pleasant, Tenn, open pit, dragline, phosphate
Mgr: R J Grissom
FLORIDA MNG DEPT, Nichols, Fla phosphate
Mgr: H L Pancoe
FLOT MILL, 7,500 tons

WILSON, DUEL M
Eufaula, Ala, bauxite

WOOD, BEVERLY C
Sweetwater, Tenn, barite

WOODWARD IRON CO
Woodward, Ala
Pres: B C Cofcord
VP: Hewitt Smith
Purch Agt: S K Stokes
PYNE MINE, 8 mi SW of Bessemer, Ala, underground, Fe
Supt: T W Davis
Asst Supt: W H Thompson
Engr: J W Hager
(See Sloss-Sheffield Steel & Iron listing)

YACKIN MICA & ILMENITE CO
(Div of the Glidden Co) Box 815, Lenoir, N C
Gen Mgr: H L Rhodes
MINE, open pit, Ilmenite
100-TON GRAV MILL, 30,000 tons year

ZONOLITE COMPANY
(See Montana listing)
MINE & PLANT, Travelers Rest, S C, open pit, Vermiculate
Mgr: J A Kelly

NORTH EASTERN

CONN, DEL, MAINE, MASS, N H, N J, N Y, OHIO, PA, R I, VT, W VA

ALAN WOOD STEEL CO
Conshohocken, Pa
Pres: J T Whiting
VP: C E Davis
Sec Treas: C L Jones
Purch Agt: G H Lange
SCRUB OAKS MINE, 6 mi NW of Dover, N J, underground, Fe (Magnetite)
Supt: W P Schenk
Fore: Chas Weiler
Engr: Walter McDougal
Prod: 3,000 tons
MAGNETIC GRAV MILL
Fore: Harry Hendershot
STEEL PLANT
Supt: H V Glunz
WASHINGTON MINE, Oxford, N J, Fe
Supt: H Leary
Engr: R M McInerney

ALLIED CHEM & DYE CORP
GENERAL CHEMICAL DIVISION
40 Rectory St, New York 6, N Y
Pres: H O C Ingraham
VP: M M Biddison
Purch Agt: F S Scherzinger
Dir Mng Oper: R H Dickson
Gen Supt: Wilbert J Trepp
Geol: D C Wysor
Met: G H Musson
(See South Eastern listing)

AMERICAN AG CHEM CO, INC
50 Church St, New York, N Y
(See South Eastern listing)

AMERICAN CYANAMID
30 Rockefeller Plaza, New York, N Y
(See South Eastern listing)

AMERICAN MACH & METALS
223 Broadway, New York, N Y
Pres: J C Vanderpyl
VP: C W Anderson
Sec: F C Keating
Treas: H T McMeekin
(See Mont listing)

AMERICAN SMELTING & REFINING CO, 120 Broadway, New York, N Y
GENERAL OFFICERS:
Ch of Bd: R W Straus
Ch of Fin Comm: J C Emison
VPs: E L Newhouse Jr, R F Goodwin, J D MacKenzie, S D Strauss, E W Thornley, J R Woodul, O W Tuckwood
VP & Gen Couns: R W Vaughan
Treas: O W Straus
Comp: E C Corson
Gen Audit: H W Grose
Sec: G A Brickington
ADVISORY COMMITTEE:
Cons Met: E P Fleming
Ch Lead Ref Met: K Harms
Mgr Ore Purch: R L Jourdan
Patent Couns: J D Dent
VP, Zn Dept: S H Levison
Dir Res Dept: A J Phillips
SMELTING & REFINING DEPT:
VP: J D MacKenzie
Asst to Pres: R P Reese Jr
MINING DEPT:
VP: R F Goodwin
Gen Mgr: W H Loerpabel
Res Engrs: C P Pollock, V I Mann
PURCHASING DEPT:
VP: E W Thornley
RESEARCH DEPT:
Dir: Dr A J Phillips
Supt: A A Smith Jr
BALTIMORE PLANT, Baltimore, Md
Mgr: H M Shepard
Gen Supt: L J Leckie
Copper Refining
PERTH AMBOY PLANT, Barber, N J
Mgr: K Harms
Asst Mgr: B J DiSanto
Copper smelting, converting & refining, lead smelting & refining
(Also see Ariz, Calif, Colo, Idaho, Ill, Kans, Md, Mont, Nebr, N Mex, N J, Okla, Tex, Utah, & Wash listings)

AMERICAN STEEL & WIRE CO
Rockefeller, Bldg, Cleveland 13, Ohio
Pres: H B Jordan
VP Chg Oper: W F Mumford
DONORA ZINC WORKS, Donora, Pa, Zn

ANACONDA COPPER MINING CO
25 Broadway, New York, N Y
Ch of Bd: C F Kelley
Pres: W H Hoover
Exec VP: R E Dwyer
VP & Gen Couns: R H Glover
VP, Mng Oper: C E Weed
VP, Met Oper: Frederick Laist
VPs: E O Sowerwine, E S McGlone, F O Case
Asst VP: R S Newlin
Compt: W K Daly
Sec & Treas: C E Moran
Ch Geol: V D Perry
(See Montana listing)

ASHLEY MINING CORP
West Rumney, N H
Pres: H A Ashley
VP & Engr: E M Shipp

BERYL MT MINE, Acworth, N H, & MINES, in Grafton Co, open pit, Beryl, Feldspar, Mica, Quartz, Columbite

BARTON MINES CORP
N Creek, Warren Co, N Y
Pres: H H Barton
VP & Gen Mgr: H H Vogel
Asst Gen Mgr: C R Barton Jr
Purch Agt: T Leonard
GARNET MINE, near N Cr, open pit
HMS GRAV FLOT MILL

BASIC REFRACTORIES, INC
845 Hanna Bldg, Cleveland 15, O
Pres: H P Eells, Jr
Purch Agt: G H Rutherford
Mgr Oper: T W Ryan
Works Mgr: M Muller
MAPLE GROVE QUARRY & PLANT, Maple Grove, Ohio, open pit
Supt: H C Bonnell
Pl Supt: A M Caito
Pl Engr: G E Stone
Prod: 1,800,000 tons yr

BETHLEHEM CORNWALL CORP
701 E Third St, Bethlehem, Pa
Pres: A F Peterson
Mgr: S J Shale
CORNWALL MINE, Cornwall, Pa
Fe, Cu, Au, Ag
6,000-TON MAGNETIC CONC
2,500-TON FLOT PL
2,000-TON SINTERING PL
Prod: 1,000,000 tons yr

CALLAHAN ZINC LEAD CO
100 Park Ave, New York
Pres: J T Hall
VP Chg Oper: R F Mahoney
Sec: Alfred Ogden
Treas: E A Salo
(See Nevada listing)

CASTLE DOME COPPER CO
61 Broadway, New York 6, N Y
Pres: E H Westlake
VP: J G Greenburgh
Sec: Henry Kaufman
Treas: J B McGee
Purch Agt: E J Morse, F L Bishop
Gen Mgr: R W Hughes
Asst Gen Mgr: B R Coil
Gen Supt: J W Still
(See Arizona listing)

CAYUGA ROCK SALT CO INC
Myers, N Y
Pres & Gen Mgr: F L Bolton
VP: J W Shannon
Sec: L A Och
Treas: L G Bolton
CAYUGA MINE, Myers, 10 mi N of Ithaca, N Y, underground, salt

CELOTEX CORP
Port Clinton, Ohio
AMERICAN #1 MINE, Gypsum

CERTAIN-TEED PROD CORP
120 E Lancaster Ave, Ardmore, Pa
Pres: R G Lizars
VPs: P E Fischer, J V Lizars
Sec: A O Graves
Gen Mgr: H F Debo
CERTAIN-TEED MINE, Akron, N Y, underground, Gypsum

CLEVELAND-CLIFFS IRON CO
1460 Union Commerce Bldg, Cleveland Ohio
Pres: A C Brown
Gen Mgr: C W Allen
(See Lake Superior listing)

CLIMAX MOLYBDENUM CO
500-5th Ave, New York 18, N Y
Pres: A H Bunker
Sec: L A Cowan
Treas: Weston Thomas
(See Colo listing)

COPPER RANGE CO
24 Federal St, Boston 10, Mass
Pres: M F LaCroix
VPs: J P Lally, P F Beaudin, F A Ayer, R W Myers
Asst to Pres: H B Ewoldt
Treas: D M Goodwin
Compt: Robert McArthur
Sec: J R Ackroyd
C G HUSSEY & CO DIVISION
VP & Div Gen Mgr: J P Lally
VP: R W Myers
Purch Agt: J G McNeely
Sales Mgr: E H Seiling
Credit Mgr: William Glenn
Pl Supt: C E Pearl
Refinery Supt: James Malok
Mast Mech: Andrew Herpak
Ch Elec: C H Wilson

DOMINION MANGANESE CORP
135 Broadway, New York 6, N Y
(See South Eastern listing)

DUPONT de NEMOURS, E I & CO
Rm 12062, Dupont Bldg, Wilmington 98, Del
(See Humphreys Gold Corp, South Eastern listing)

EASTERN MAGNESIA TALC CO
206 Bank St, Burlington, Vt
JOHNSON #4, Johnson, Vt
WATERBURY #2, Waterbury, Vt, talc & Soapstone

EBSARY GYPSUM CO, INC
615 Powers Bldg, Rochester 4, N Y
Treas: F W Allen
WHEATLAND MINE, Nomford N Y, Gypsum
SCOTTSVILLE MILL

EMPIRE STAR MINES CO, LTD
14 Wall St, New York 5, N Y
Pres: J R Mann
Sec Treas: H E Dodge
Gen Mgr: H R Fitzpatrick
Purch Agt: William Carman
(See Calif listing)

GENERAL ABRASIVE CO INC
Niagara Falls, N Y
Pres: A V Parker
VP: R MacDonald Jr
Gen Mgr: L M Richard
(See South Eastern listing)

GOLDING KEENE CO
Box 2151, Trenton 2, N J
COLONY & KIDDOR MINES, Alstead, N H, Feldspar, Mica, Quartz

GOUVERNEUR TALC CO, INC
Box 178, Gouverneur, N Y
MINE, Gouverneur, talc & soapstone

GRAPHITE MINES, INC
Box 92, Auburn Station, Cranston, R I
Treas: P T Kaine
OPERATIONS, Providence Co, Graphite

HANNA, M A CO
1300 Leader Bldg, Cleveland 14, Ohio
(See Lake Superior listing)

HUSSEY C G & CO DIVISION
(See Copper Range Co)

INSPIRATION CONS COPPER CO
25 Broadway, New York 4, N Y
Pres: W D Thornton
VP: R S Newlin
Sec Treas: H M Jacob
Personnel Mgr: L E Caldwell
Auditor: E M Bredwell
(See Arizona listing)

INTERNAT'L SALT CO, INC
Retsof, N Y
Pres: E L Fuller
VP: H M Griffith
VP: H Osborn
RETSOF MINE, 4 mi W of Geneseo, N Y, underground, rock salt
Gen Mgr: T F Courthope
Purch Agt: J A Cooney
Pl Mgr: S Martin
Mech Engr: R Goetz
Elec Engr: D L Moynes

INTERNAT'L SMELTING & REFINING CO, Perth Amboy, N J
RARITAN COPPER WORKS
PERTH AMBOY SMELTER, Cu

INTERNAT'L TALC CO, INC
Box 296, Gouverneur, N Y
FREEMAN MINE, Talcville, N Y, underground
WIGHT & #3 MINES, Gouverneur, N Y, underground, Talc & Soapstone

JONES & LAUGHLIN ORE CO
(Subsidiary of Jones & Laughlin Steel Corp)
Star Lake, N Y
Ch of Bd: Admiral Ben Moreell
Pres: C C Henning
Gen Supt: W R Webb
Asst Gen Supt: R B Fleck
BENSON MINES, 32 mi E of Gouverneur, N Y, open pit, Fe
Engr: Elmer Smeby
Gen Fore: W P Bach
Mech Engr: Carl Djuvik
Elec Engr: R F Peterson
Pers Dir: M O Peterson
Mast Mech: P L VerSteeg
GRAV MAG MILL
Gen Fore: W A Vickers
Met: R E Durocher
Capacity: 1,300,000 tons yr
SINTER PLANT
Supt: R W West
Capacity: 850,000 tons yr

KENNECOTT COPPER CORP
161 E 42nd St, New York 17, N Y
Pres: C R Cox
VPs: J C Kinnear, R C Klugescheid
Ch Exec Comm: C T Ulrich
Sec: R C Sullivan
Treas: E S Hann
Asst Sec & Treas: G B Russell
Gen Purch Agt: R P Lamborn
Gen Traffic Mgr: R E Taylor
(See Utah listing)

LOOMIS, W H, TALC CORP
223 E Main St, Gouverneur, N Y
Pres: E W Magnus
VP: Donald Hagar
Sec: A P Loomis
Gen Mgr: E E Eschilsen
Prod Mgr: B B Bailey
ARNOLD #1, WOODCOCK #3, & ONTARIO #4 MINES, 8 mi from Gouverneur, underground, Talc
Supt: Stanley Kio
Foremen: A D Leary (Arnold), Leslie Hull (Woodcock), Arthur Craig (Ontario)
Engr: D G Ryder
MILLS #1, 2, & 3, Fowler, N Y
Supt: Leonard Breeman Jr
Foremen: Harold Fowler (#1), Byron Gale (#2), Claude Noble (#3)

MIAMI COPPER CO
61 Broadway, New York 6, N Y
Pres: E H Westlake
VP: John Greenburgh
Sec: Henry Kaufman
Treas: J B McGee
Gen Mgr: R W Hughes
Asst Gen Mgr: B R Coil
Purch Agts: E J Morse, F L Bishop
Gen Supt: J W Still
(See Arizona listing)

MOLYBDENUM CORP of AMERICA
500 Fifth Ave, New York, N Y
Pres: Marx Hirsch
VP: E A Lucas
Treas: W B Kuntz
(See Calif & New Mex listings)

NATIONAL GYPSUM CO
325 Delaware Ave, Buffalo 2 N Y
Pres: M H Baker
Exec VP: L R Sanderson
VP Chg Mfg: F A Manske
VP, Sales: D D Crandell
VP, Finance: C E Masters
VP, Contract Sales: J C Best
Treas: W S Corrie
Sec: W M North
Compt: R H Means
Purch Agt: E T Obenchain
Ch Engr: S D Skinner
Supv, Mines & Quarries: D E Eilertsen
MINE & PLANT, Clarence Ctr, N Y underground, Gypsum
Pl Mgr: L H Seufert
Mine Supt: L D Liles
MINE & PLANT, Bellefonte Pa, underground, Limestone
Pl Mgr: H E Gustafson
Mine Supt: J H Kelly
QUARRY & PLANT, Luckey, Ohio, Limestone
Pl Mgr: F C Mallery
Quarry Supt: J DeMarco
QUARRY & PLANT, York, Pa, Limestone
Pl Mgr: W W Wallace
Quarry Supt: C E Tesnow
(See South Eastern listing)

NATIONAL LEAD CO
111 Broadway, New York 6, N Y
Pres: J A Martino
VP: H C Wildner
Gen Mgr: J H Reid
Asst Mgr: F R Milliken
TITANIUM DIVISION
MacINTYRE DEVELOPMENT, Tahawus, 30 mi N of North Creek, N Y, open pit, Titanium, Fe
Pl Mgr: P W Allen
Asst Pl Mgr: J A Poll
Purch Agt: Leon de Polac
Gen Supt: C R Begor Jr
Mine Supt: C R Begor Sr
Geol: John Holland
4,000-TON GRAV FLOT MILL, MAG
Supt: J J Strohl
Foremen: W P Jenkins, E Geroux
Assay: H M Davies
THREE PAN GREENAWALT SINTERING
Pl Supt: B A Kingman
Prod: 4,000 tons
(See S Central, Calif, Nev & Tex listings)

NEW JERSEY ZINC CO
160 Front St, New York, N Y
Ch of Bd: H Hardenbergh
Pres: R L McCann
Gen Mgr Mines: S S Goodwin
Gen Purch Agt: W J Lee
FREIDENSVILLE MINE, Lehigh Co, Pa, Zn
MINES, Franklin & Ogdensburg, N J, Zn
MAG & GRAV MILLS
Gen Supt: W F Evans
(See South Eastern listing)

NORTON CO
Worcester 6, Mass
Pres: M F Higgins
VP & Gen Mgr: A B Holmstrom
Sec: M N Pilsworth
Treas: W J Magee
(See South Central listing)

NEW YORK-ALASKA GOLD DRG
41 Broad St, New York, N Y
Pres: Alfred Ely
Sec: Charles Ernst
(See Alaska & Wash listings)

OZARK-MAHONING CO
(See Oklahoma listing)
FLUORSPAR FILTER CAKE DRYING PLANT, Wilmington Del
Purch Agt: J L Cadden
Pl Supt: W V Kuster
(See North & South Central listings)

PECHNEK BROS
Box 233, South Paris 3, Maine
FRED STEARNS, Twitchell, Mt Marie, Thomas & Roy Wardell Mines, Oxford Co

PENNA SALT MFG CO
1000 Widener Bldg, Philadelphia, Pa
(See South Eastern listing)

PHELPS DODGE CORP
40 Wall St, New York 5, N Y
Ch of Bd: L S Cates
Pres: R G Page
VPs: C E Dodge, G R Drysdale, H M Lavender
Compt: J M Hawkins
Asst Compts: K A Lawrence, A F Peterson
Treas & Asst Sec: M W Urquhart
Asst Sec Treas: H R Dobbs, R D Barnhart
Gen Atty: Debevois, Plimpton & McLean, New York
Gen Sales Mgr: W C Bennet
Mgr of Sales: C H Winship
Gen Purch Agt: P G Lee
Gen Traffic Mgr: J W Lee
Asst Gen Traffic Mgr: B Ponessa
(See Arizona listing)

PHELPS DODGE REFINING CORP
40 Wall St, New York 5, N Y
(Subsidiary of Phelps Dodge Corp)
Pres: W C Bennett
VPS: C E Dodge, J P Dyer, C S Harloff
Sec & Couns: J B Beaty
Compt: J M Hawkins
Asst Compt: Raymond Soden
Treas: M W Urquhart
Asst Treas: H R Dobbs, R D Barnhart
LAUREL HILL REFINERY & SMELTER, Laurel Hill, N Y
Works Mgr: Howard Barkell
Produces elec copper, copper sulfate, nickel sulfate, selenium, tellurium
(See Texas listing)

PHOENIX GYPSUM CO, INC
Oakfield, N Y
Sec: J D Chamberlain
MINE & MILL, Alabama, Genesee Co, N Y, Gypsum

REPUBLIC STEEL CORP
Republic Bldg, Cleveland 1, Ohio
OLD BED, HARMONY & FISHER HILL MINES, Mineville, N Y, undgrnd, Fe
Mgr: W J Linney
Asst Mgr: F J Myers
Supts: J R Brennan, J R Murphy
Engr: W A Blomstran
Maint Supt: M L Dezendorf
Ch Engr: A K McClellan Jr
Prod: 2,000,000 tons yearly
MAGNETIC MILL
Supt: L E Dufrane
Assy: J Jacka
Ch Elec: J R Brennan Jr
Prod: 1,300,000 tons yearly
CHATEAUGAY MINE, Lyon Mt, N Y, underground, open pit, Fe
Mgr: W J Linney
Asst Mgr: W G Crusberg
Supt: Jos Tolosky Sr
Ch Engr: P J McMenamin
Maint Supt: Howard Pigg
Elec: Peter Daniels
Prod: 1,250,000 tons yearly
CHATEAUGAY MILL, Magnetic
Supt: E Furness
Assay: J M Scott
Prod: 385,000 tons conc yearly
(See North & South Central listing)

RICHARD ORE CO
Wharton, New Jersey
Pres: F W Coburn
VP: Fordyce Coburn
Gen Mgr: M J Brophy
Cons Engr: M T Hostar
Purch Agt: J F Ryan
RICHARD MINE, near Wharton, underground, Fe
Supt: Richard Dockeray
Safety Engr: W P Galligan
Mine Engr: A J Getz
Mech Engr: J J Burchko
Elec Engr: George Gawthorn
Elec: Harry Martin
600-TON MAGNETIC MILL
Supt: P W Keim

RINGWOOD IRON MINES, INC
Ringwood, N J
Pres & Gen Mgr: Lewis Sanders
VP: D A Goodkind
Sec: C S Stern
PETERS & CANNON MINES, Ringwood, Fe, 45 mi NW of New York City, dev
Supt: B H DeLucas
PETERS MILL, Mangetic-grav, 2000-ton
Supt: W A Kaattari
Asst Supt: N K Karchmer
Foreman: W Stephens

RUBERIOD CO, THE
500 5th Ave, New York, N Y
VERMONT ASBESTOS MINES DIV, Hyde Park, Vt
Gen Mgr: M J Messel
Purch Agt: K Foster
VERMONT ASBESTOS MINES, Hyde Park, asbestos, chrysotile
Supt: Morgan Potter
Engr: John Stewart
MILL, Lowell, Vt, crushing & air sep
Supt: Carl White

SNYDER MINING CO
812 Oliver Bldg, Pittsburg, Pa
Pres: W P Snyder Jr
VP: E P Wilson
Asst to Pres: Al Fairley Jr
Sec: L B Perrin
Treas: J K Foster
(See Lake Superior)

ST JOSEPH LEAD CO
250 Park Ave, New York, N Y
Ch of Bd: C H Crane
Pres: Andrew Fletcher
Sec: Robert Bennett
ZINC MINES & MILLS, Edwards & Balmat, N Y
1,650 TON MILL EQUIPMENT
Prod: 500,000 tons ore annually
ZINC SMELTER, Josephtown, Pa
Prod: 72,000 tons Zn, large tonnage zinc oxide annually
(See North & South Central listing)

TRI-STATE ZINC CO
70 Pine St, New York, N Y
Pres: C O Lindberg
Sec Treas: J H Nicholls

TRUSIANI, CESARE
Topsham, Maine
DESMOND MATCH, Topsham Me, Feldspar, Mica, And Quartz

TUNGSTEN MINING CORP
500 5th Ave, New York 18, N Y
Pres: H S West
VP: W L Long
Gen Mgr: J R Sweet
Sec Treas: H V Dorr
Purch Agt: G V Boyd
(See South Eastern listing)

U S GYPSUM CO
(See North & South Central)
MINE, Gypsum, Ohio, undgrnd, Gypsum
MINE, Falls Village, Conn, open pit limestone
MINE, Farnams, Mass, open pit, limestone
MINE, Oakfield N Y, undgrnd, Gypsum

U S METALS REFINING CO
(Controlled by American Metals Co, Ltd)
61 Broadway, New York, N Y
Ch of Bd: Walter Hochschild
Pres: Hugo de Neufville
Sec: T W Childs
Mgr: F H Dyke
Asst Mgr: Douglas Tennant
SMELTER & REFINERY, Carteret, N J
Cu, Ag, Au
Annual Prod: 144,000 tons Cu, 60,000,000 oz Ag, 900,000 oz Au, 40,000 tons misc

U S SMELTING, REFINING & MINING CO (See Utah listing)
75 Federal St, Box 2137, Boston, Mass
Pres: F S Mulock

U S STEEL COMPANY
(Subsidiary of U S Steel Corp)
436 7th Ave, Pittsburgh 30, Pa
Pres: Benjamin F Fairless
Exec VP, Oper: Clifford Hood
Exec VP, Comm: D F Auston
Exec VP, Law & Sec: R M Blough
Exec VP, Engr: M W Reed
Exec VP, Acct: G W Rooney
(See South Eastern listing)

U S VANADIUM CO
30 E 42nd St, New York 17, N Y
Pres: E W Remmers
VPS: J E Horn, O F Holmgren, J H Spillane
Gen Mgr: A P Cartelynu
(See Colo listing)

UNIVERSAL ATLAS CEMENT CO
100 Park Ave, N Y 17, N Y
Compt: H C Schmielau
OPERATIONS, Clarence Center, N Y Gypsum

VANADIUM CORP of AMERICA
420 Lexington Ave, New York 17, N Y
Pres: W C Keeley
Exec VP: P J Gibbons
Sec-Compt: B O Brand
Purch Agt: S W Stewart
Treas: L C Miller
(See Colo, New Mex, Ariz & Utah listings)

VERMONT ASBESTOS MINES DIV
(See the Rubberoid Co)

VERMONT COPPER CO
S Strafford, Vt
Ch of Bd: G A Ellis
Pres: J F Cowley
VP & Mgr: D B Benson
Sec: S C Wilson
Purch Agt: Harold Davis
ELIZABETH ELY & PIKE HILL MINES, S Strafford, underground, Cu, S, Fe, Ag
Supt: F A Taft
Asst Supt: C F Banker
Engr: R E Little
Prod: 750 tons
750-TON FLOT MILL
Supt: A J McDonnell
Foreman: Chas Adolph
Prod: 250,000 tons yr

VERMONT MIN PROD, INC
Chester, Vt
READING QUARRY, Reading, Vt

VERMONT TALC CO
Chester, Vt
Pres: T A Yager
Gen Supt: Joseph Winot
MINE, Windham, Vt, open pit, Talc
MILL, Chester, Vt

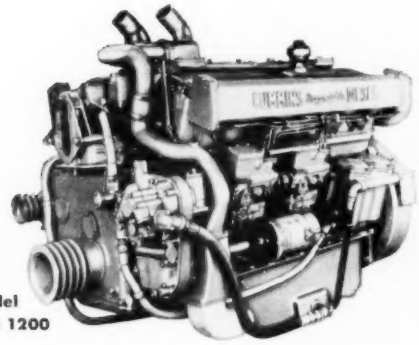
WARREN FOUNDRY & PIPE
55 Liberty St, New York, & Box 392, Dover, N J
Ch of Bd: S Shahmoom
Pres: L R Dohm
VP: T H Walker Jr
Sec Treas: E L Hopler
Gen Mgr: F G Woodruff
Purch Agt: Henry Chidsey
MT HOPE MINE, Mt Hope, N J, Fe
Supt: Clinton L Miller
Asst Supts: John Sheplak, Koehler Stout
Foremen: H Buckingham, J Haien
Engr: T J Holland
Elec Engr: Charles Struble Jr
Safety Engr: Randolph Brogan
Ch Geol: Allan James
Prod: 1000 tons
1000-TON FLOT MILL
Supt: H J Schwellenbach
Asst Supt: P Davenport

WEIRTON STEEL CO
Weirton, W Va
WEIRTON MINE, Morgantown, Fe

WHITEHALL CO., INC
17 Battery Pl, New York 4, N Y
Pres: Eversley Childs
VP: A E Davison
VP & Gen Mgr: P B Verplanck
RUGGLES MINE, Grafton, N H, open pit, Feldspar, Mica, Beryl, Spodumene

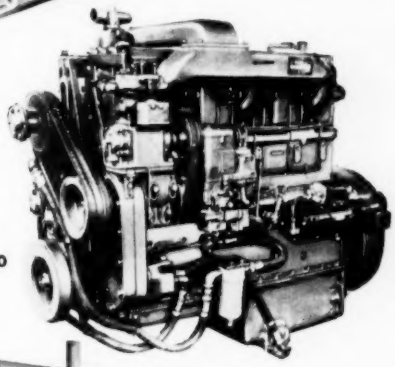
INDEX OF ADVERTISERS

Cummins Diesels are doubly dependable...because they're BUILT NOT ONCE BUT TWICE

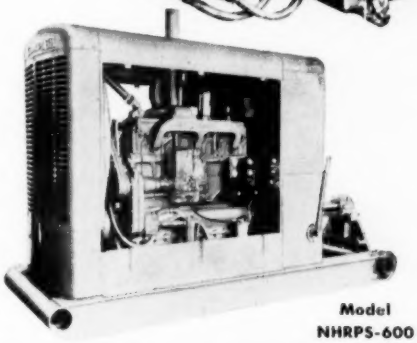


Model NVHBIS 1200

Model LI-600



Model NHRBS-600



Model NHRPS-600

Cummins® Dependable Diesels are manufactured in a complete line of models, 50 to 550 hp, suitable for heavy-duty trucks, tractors, shovels, cranes, draglines, earth-movers, rock crushers, industrial locomotives, dredges, air compressors, and other types of powered equipment used in mines and quarries. When you invest in a Cummins Diesel, you own the product of a company which has manufactured Diesel engines exclusively for 33 years. Cummins developed America's first lightweight, high-speed Diesel and has steadily reduced power costs and increased profits for owners of Cummins Dependable Diesels. Write for the Cummins general catalog, or for specification sheets pertaining to individual models.

CUMMINS ENGINE COMPANY, INC.

Columbus, Indiana

CUMMINS Dependable DIESEL

Trademark Reg. U. S. Pat. Off.

The nation-wide dealer organization of Cummins Engine Company, Inc. assures comprehensive service facilities in all principal cities...complete shop equipment, expert mechanics and Genuine Cummins Parts.

CONDENSED SPECIFICATIONS

MODELS	A-600	HR-400	H-600	HR-600	HRBB-600	HS-600	NH-600	HRS-600	NHS-600	NHRS-600	NVH-1200	NVHS-1200	L-600	LR-600
Cylinders	6	4	6	6	6	6	6	6	6	6	12	12	6	6
Bore	4"	5 1/8"	4 7/8"	5 1/8"	5 1/8"	4 7/8"	5 1/8"	5 1/8"	5 1/8"	5 1/8	5 1/8"	5 1/8"	7"	7 1/4"
Stroke	5"	6"	6"	6"	6"	6"	6"	6"	6"	6"	6"	6"	10"	10"
Disp. (Cu. In.)	377	495	672	743	743	672	743	743	743	743	1486	1486	2309	2477
HP (Max.)	100	110	150	165	175	200	200	225	275	300	400	550	250	300
RPM (Max.)	2200	1800	1800	1800	2000	1800	2100	1800	2100	2100	2100	2100	1000	1100

SEATTLE, Cummins Diesel Sales of Washington, Inc.: 2520 Airport Way, Seattle 4, Washington, Telephone Main 7160. *Authorized Sales & Service:* Kenny's Cummins Diesel Service, Aberdeen, Washington; Yakima Commercial Company, Yakima, Washington . . . **SPOKANE, Cummins Diesel Sales, Inc.:** South 155 Sherman Street, Box 2185, Spokane 5, Washington, Telephone Madison 0101 . . . **PORTLAND, Cummins Diesel Sales of Oregon, Inc.:** 1225-1235 Southeast Grand Avenue, Portland 14, Oregon, Telephone East 7146. *Branch:* 731 Garfield Street, P.O. Box 367, Eugene, Oregon. *Authorized Sales & Service:* Diesel Sales & Service, Inc., Grants Pass, Oregon . . . **BOISE, Cummins Diesel Sales of Idaho, Inc.:** 1204 Front Street, Boise, Idaho, Telephone 3783 . . . **SAN FRANCISCO, Watson & Meehan:** 1960 Folsom Street, San Francisco 3, California, Telephone Market 1-8930. *Branch:* 248 Palm Avenue, Fresno 3, California. *Authorized Sales & Service:* Connell Motor Truck Company, Stockton, California; Frank J. Coyle, Sacramento, California; Connell Motor Truck Company of Redding, Redding, California; Fred E. Barnett Company, Eureka, California; Nevada Transit Company, Reno, Nevada . . . **LOS ANGELES, Cummins Service & Sales:** 1661 McGarry Street, Los Angeles 21, California, Telephone Prospect 1021. *Branch:* 401 Golden State Highway, Bakersfield, California. *Authorized Sales & Service:* Leo's Diesel Service, Blythe, California; Smith's Diesel Sales, Colton, California; Rhyne's Automotive Service, El Centro, California; San Luis Truck Service, San Luis Obispo, California; F. R. Laux Diesel Service, San Diego, California; Hanson Equipment Company, Santa Maria, California; Newton Automotive Service, Baker, California . . . **PHOENIX, Cummins & Moran:** 1350 North 22nd Avenue, Phoenix, Arizona, Telephone 8-2668. *Branch:* 1921 North Broadway, Albuquerque, New Mexico. *Authorized Sales & Service:* Cooper Tractor Service, Yuma, Arizona; Stirling Diesel Service, Las Vegas, Nevada; Willis Diesel Engine Service, El Paso, Texas . . . **SALT LAKE CITY, Cummins Intermountain Diesel Sales Company:** 1030 Gale Street, Salt Lake City, Utah, Telephone 9-3768. *Authorized Sales & Service:* Wally's Chevron Truck Service, Cedar City, Utah; Automotive Body and Machine, Inc., Idaho Falls, Idaho; Jim Macy's, Blue Bell Truckatorium, Rock Springs, Wyoming; Renouf & Thompson, 38 East 100 North, St. George, Utah, Telephone 223.

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